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# LED LCD TV

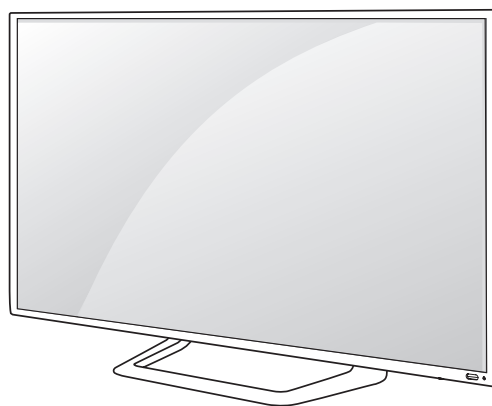
# SERVICE MANUAL

CHASSIS : LA23E

**MODEL : 55LM9600    55LM9600-UC**

## CAUTION

BEFORE SERVICING THE CHASSIS,  
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL67460305 (1204-REV00)

Printed in Korea

# CONTENTS

<b>CONTENTS .....</b>	<b>2</b>
<b>PRODUCT SAFETY .....</b>	<b>3</b>
<b>SPECIFICATION .....</b>	<b>4</b>
<b>ADJUSTMENT INSTRUCTION .....</b>	<b>10</b>
<b>EXPLODED VIEW .....</b>	<b>18</b>
<b>SCHEMATIC CIRCUIT DIAGRAM .....</b>	

# SAFETY PRECAUTIONS

## IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by  $\triangle$  in the Schematic Diagram and Exploded View.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

### General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

### Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

### Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 M $\Omega$  and 5.2 M $\Omega$ .

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

### Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

### Do not use a line Isolation Transformer during this check.

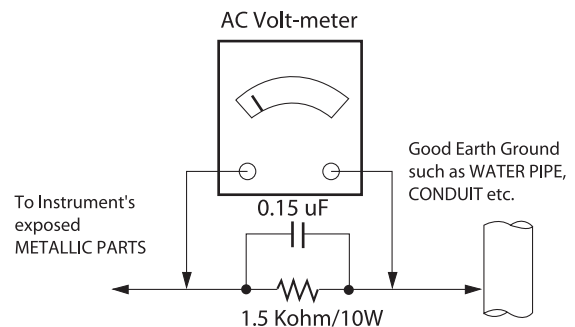
Connect 1.5 K / 10 watt resistor in parallel with a 0.15  $\mu$ F capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5 mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

### Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1  $\Omega$

\*Base on Adjustment standard

# SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

## 1. Application range

This spec sheet is applied LCD TV with ( LA23E ) chassis

## 2. Test condition

Each part is tested as below without special notice.

- 1) Temperature : 25 °C ± 5 °C (77±9 °F), CST : 40±5 °C
- 2) Relative Humidity: 65 % ± 10 %
- 3) Power Voltage : Standard input voltage  
(220~240V@ 60Hz)
- 4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
- 5) The receiver must be operated for about 20 minutes prior to the adjustment.

## 3. Test method

- 1) Performance: LGE TV test method followed
- 2) Demanded other specification
  - Safety : UL, CSA, CE, IEC specification
  - EMC: FCC, ICES, CE, IEC specification
  - Wireless : WirelessHD Specification (Option)

## 4. General Specification

No	Item	Specification		Remark
1	Market	1) North America		
2	Broadcasting System	1) ATSC / NTSC		
3	Receiving System	1) VSB/64 & 256 QAM/ NTSC-M		
4	Input Voltage	AC 100 ~ 240V 50/60Hz		FHD + T120Hz
5	Available Channel	1) VHF : 02~13 2) UHF : 14~69 3) DTV : 02-69 4) CATV : 01~135 5) CADTV : 01~135		
6	Screen Size	47/55 inche Wide(1920 × 1080)		47/55LM9600-UC
7	Aspect Ratio	16:9		
8	Tuning System	FS		
9	LCD Module	LC470DUT-SEF1	LGD	47LM9600-UC
		LC550DUT-SEF1	LGD	55LM9600-UC
10	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %		
11	Storage Environment	1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %		

## 5. External input format

### 5.1. 2D mode

#### 5.1.1. Component input (Y, CB/PB, CR/PR)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1.	720*480	15.73	60.00	13.5135	SDTV ,DVD 480I
2.	720*480	15.73	59.94	13.50	SDTV ,DVD 480I
3.	720*480	31.50	60.00	27.027	SDTV 480P
4.	720*480	31.47	59.94	27.00	SDTV 480P
5.	1280*720	45.00	60.00	74.25	HDTV 720P
6.	1280*720	44.96	59.94	74.176	HDTV 720P
7.	1920*1080	33.75	60.00	74.25	HDTV 1080I
8.	1920*1080	33.72	59.94	74.176	HDTV 1080I
9.	1920*1080	67.50	60.00	148.50	HDTV 1080P
10.	1920*1080	67.432	59.94	148.352	HDTV 1080P
11.	1920*1080	27.00	24.00	74.25	HDTV 1080P
12.	1920*1080	26.97	23.94	74.176	HDTV 1080P
13.	1920*1080	33.75	30.00	74.25	HDTV 1080P
14.	1920*1080	33.71	29.97	74.176	HDTV 1080P

#### 5.1.2. RGB Input (PC)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
1	640*350	31.468	70.09	25.17	EGA	X
2	720*400	31.469	70.08	28.32	DOS	O
3	640*480	31.469	59.94	25.17	VESA(VGA)	O
4	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6	1360*768	47.712	60.015	85.50	VESA (WXGA)	X
7	1920*1080	67.5	60	148.8	WUXGA (Reduced Blanking)	O

### 5.1.3. HDMI Input 1 (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
HDMI-PC						
1	31.468	70.09	25.17	25.17	EGA	X
2	31.469	70.08	28.32	28.32	DOS	O
3	31.469	59.94	25.17	25.17	VESA(VGA)	O
4	37.879	60.31	40.00	40.00	VESA(SVGA)	O
5	48.363	60.00	65.00	65.00	VESA(XGA)	O
6	54.348	60.053	80.00	85.50	VESA	O
7	63.981	60.020	108.00	108.00	VESA (SXGA)	O
8	47.712	60.015	85.50	148.5	VESA (WXGA)	O
9	1920*1080	67.5	60	148.5	WUXGA(Reduced Blanking)	O
HDMI-DTV						
1	720*480	31.50	60.00	27.027	SDTV 480P	
2	720*480	31.47	59.94	27.00	SDTV 480P	
3	1280*720	45.00	60.00	74.25	HDTV 720P	
4	1280*720	44.96	59.94	74.176	HDTV 720P	
5	1920*1080	33.75	60.00	74.25	HDTV 1080I	
6	1920*1080	33.72	59.94	74.176	HDTV 1080I	
7	1920*1080	67.50	60.00	148.50	HDTV 1080P	
8	1920*1080	67.432	59.94	148.352	HDTV 1080P	
9	1920*1080	27.00	24.00	74.25	HDTV 1080P	
10	1920*1080	26.97	23.976	74.176	HDTV 1080P	
11	1920*1080	33.75	30.00	74.25	HDTV 1080P	
12	1920*1080	33.71	29.97	74.176	HDTV 1080P	

## 5.2. 3D mode

### 5.2.1. RF Input

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	45	60	74.25	HDTV 1080I	Side by Side (Half), Top & Bottom
2	1280*720	45	60	74.25	HDTV 720P	Side by Side (Half), Top & Bottom

### 5.2.2. USB Input (3D supported mode automatically)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.00	74.25	HDTV 1080p	Side by Side (Half), Top & Bottom, Checkerboard, MPO (Photo)

### 5.2.3. USB Input (3D supported mode manually)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.00	74.25	HDTV 1080p	Side by Side (Half), Top & Bottom Checkerboard, Single Frame Sequential, Row Interleaving, Column Inter- leaving (Photo : Side by Side, Top & Bot- tom)

### 5.2.4. HDMI-PC Input (3D supported mode manually)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Remark
1	1024*768	48.363	60.004	65.000	Side by Side (Half), Top & Bottom
2	1360*768	47.712	60.015	85.500	Side by Side (Half), Top & Bottom
3	1920*1080	67.50	60.00	148.50	Side by Side (Half), Top & Bottom Checkerboard, Single Frame Sequential Row Interleaving, Column Interleaving

### 5.2.5. RGB-PC Input

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Remark
1	1920*1080	67.5	60.000	148.5	Side by Side (Half) , Top & Bottom
2	1360*768	47.712	60.015	85.50	Side by Side (Half) , Top & Bottom
3	1024*768	48.363	60.00	65.00	Side by Side (Half) , Top & Bottom

### 5.2.6. HDMI 1.3(3D supported mode manually)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Remark
1	1280*720p	45.00	60.00	74.25	Side by Side (Half) , Top & Bottom, Single Frame Sequential
2	1920*1080i	33.75	60.00	74.25	Side by Side (Half) , Top & Bottom
3	1920*1080p	67.50	60.00	148.50	Side by Side (Half) , Top & Bottom Checkerboard, Single Frame Sequential Row Interleaving, Column Interleaving
4	1920*1080p	27.00	24.000	74.25	Side by Side (Half) , Top & Bottom Checkerboard
5	1920*1080p	33.75	30.000	74.25	Side by Side (Half), Top & Bottom Checkerboard

### 5.2.7. HDMI 1.4a(3D supported mode automatically)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1280*720p	89.91 / 90.00	59.94 / 60.00	148.35 / 148.50	Mandatory	Frame Packing,
2	1280*720p	44.96 / 45.00	59.94 / 60.00	74.18 / 74.25	Mandatory	Top & Bottom
3	1920*1080i	33.72 / 33.75	59.94 / 60.00	74.18 / 74.25	Mandatory	Side by Side (Half)
4	1920*1080p	43.94 / 54.00	23.97 / 24.00	148.35 / 148.50	Mandatory	Frame Packing,
5	1920*1080p	26.97 / 27.00	23.97 / 24.00	74.18 / 74.25	Mandatory	Top & Bottom
6	1280*720p	44.96 / 45.00	59.94 / 60.00	74.18 / 74.25	Primary	Side by Side (Half)
7	1920*1080i	67.432 / 67.50	59.94 / 60.00	148.35 / 148.50	Primary	Frame Packing
8	1920*1080p	67.43 / 67.50	59.94 / 60.00	148.35 / 148.50	Primary	Top & Bottom
9	1920*1080p	26.97 / 27.00	23.97 / 24.00	74.18 / 74.25	Primary	Side by Side (Half)
10	1920*1080p	67.432 / 67.50	29.976 / 30.00	148.35 / 148.50	Primary	Frame Packing,
11	1920*1080p	33.716 / 33.75	29.976 / 30.00	74.18 / 74.25	Primary	Top & Bottom
12	1920*1080i	33.72 / 33.75	59.94 / 60.00	74.18 / 74.25	Secondary	Top & Bottom
13	1920*1080p	67.43 / 67.50	59.94 / 60.00	148.35 / 148.50	Secondary	Side by Side (Half)
14	1920*1080p	33.716 / 33.75	29.976 / 30.00	74.18 / 74.25	Secondary	Side by Side (Half)
15	720*480p	62.938 / 63.00	59.94 / 60.00	54.00 / 54.054	Secondary (16:9)	Frame Packing,
16	720*480p	31.469 / 31.50	59.94 / 60.00	27.00 / 27.027	Secondary (16:9)	Top & Bottom
17	720*480p	31.469 / 31.50	59.94 / 60.00	27.00 / 27.027	Secondary (16:9)	Side by Side (Half)
18	720*480p	62.938 / 63.00	59.94 / 60.00	54.00 / 54.054	Secondary (4:3)	Frame Packing,
19	720*480p	31.469 / 31.50	59.94 / 60.00	27.00 / 27.027	Secondary (4:3)	Top & Bottom
20	720*480p	31.469 / 31.50	59.94 / 60.00	27.00 / 27.027	Secondary (4:3)	Side by Side (Half)
21	640*480p	62.938 / 63.00	59.94 / 60.00	50.35 / 50.40	Secondary	Frame Packing,
22	640*480p	31.469 / 31.50	59.94 / 60.00	25.175 / 25.20	Secondary	Top & Bottom
23	640*480p	31.469 / 31.50	59.94 / 60.00	25.175 / 25.20	Secondary	Side by Side (Half)
24	1280*720p	89.91 / 90.00	59.94 / 60.00	148.35 / 148.50		Line Alternative
25	1280*720p	44.96 / 45.00	59.94 / 60.00	148.35 / 148.50		Side by Side (Full)
26	1920*1080i	67.432 / 67.50	59.94 / 60.00	148.35 / 148.50		Field Alternative
27	1920*1080i	33.72 / 33.75	59.94 / 60.00	148.35 / 148.50		Side by Side (Full)
28	1920*1080p	43.94 / 54.00	23.97 / 24.000	148.35 / 148.50		Line Alternative
29	1920*1080p	26.97 / 27.00	23.97 / 24.000	148.35 / 148.50		Side by Side (Full)
30	1920*1080p	67.432 / 67.50	29.976 / 30.00	148.35 / 148.50		Line Alternative
31	1920*1080p	33.716 / 33.75	29.976 / 30.00	148.35 / 148.50		Side by Side (Full)
32	720*480p	62.938 / 63.00	59.94 / 60.00	54.00 / 54.054	16:9	Line Alternative
33	720*480p	31.469 / 31.50	59.94 / 60.00	54.00 / 54.054	16:9	Side by Side (Full)
34	720*480p	62.938 / 63.00	59.94 / 60.00	54.00 / 54.054	4:3	Line Alternative
35	720*480p	31.469 / 31.50	59.94 / 60.00	54.00 / 54.054	4:3	Side by Side (Full)
36	640*480p	62.938 / 63.00	59.94 / 60.00	50.35 / 50.40		Line Alternative
37	640*480p	31.469 / 31.50	59.94 / 60.00	50.35 / 50.40		Side by Side (Full)

### 5.2.8. DLNA Input (3D supported mode automatically)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.00	74.25	HDTV 1080p	Side by Side (Half), Top & Bottom, Checkerboard, MPO (Photo)

### 5.2.9. DLNA Input (3D supported mode manually)

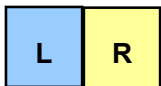
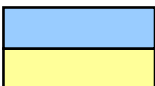
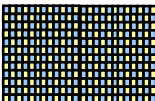
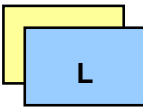
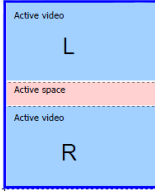

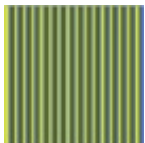
No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.00	74.25	HDTV 1080p	Side by Side (Half), Top & Bottom Checkerboard, Single Frame Sequential, Row Interleaving, Column Interleaving (Photo : Side by Side, Top & Bottom)

### 5.2.10. Component Input

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1280*720	44.96	59.94	74.176	HDTV 720P	Side by Side, Top & Bottom
2	1920*1080	33.75	60.00	74.25	HDTV 1080I	Side by Side, Top & Bottom
3	1920*1080	33.72	59.94	74.176	HDTV 1080I	Side by Side, Top & Bottom
4	1920*1080	67.500	60	148.50	HDTV 1080P	Side by Side, Top & Bottom
5	1920*1080	67.432	59.94	148.352	HDTV 1080P	Side by Side, Top & Bottom
6	1920*1080	27.000	24.000	74.25	HDTV 1080P	Side by Side, Top & Bottom
7	1920*1080	26.97	23.976	74.176	HDTV 1080P	Side by Side, Top & Bottom
8	1920*1080	33.75	30.000	74.25	HDTV 1080P	Side by Side, Top & Bottom
9	1920*1080	33.71	29.97	74.176	HDTV 1080P	Side by Side, Top & Bottom

## 5.3. 2D to 3D Mode

- Remark: 3D Input mode

No.	Side by Side	Top & Bottom	Checkerboard	Single Frame Sequential	Frame Packing	Line Interleaving	Column Interleaving
1							

# ADJUSTMENT INSTRUCTION

## 1. Application Range

This spec. sheet applies to LA23E/J Chassis applied LCD TV all models manufactured in TV factory

## 2. Specification

- (1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
- (2) Adjustment must be done in the correct order.
- (3) The adjustment must be performed in the circumstance of  $25 \pm 5^{\circ}\text{C}$  of temperature and  $65 \pm 10\%$  of relative humidity if there is no specific designation.
- (4) The input voltage of the receiver must keep 100~240V, 50/60Hz.
- (5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over  $15^{\circ}\text{C}$   
In case of keeping module is in the circumstance of  $0^{\circ}\text{C}$ , it should be placed in the circumstance of above  $15^{\circ}\text{C}$  for 2 hours  
In case of keeping module is in the circumstance of below  $-20^{\circ}\text{C}$ , it should be placed in the circumstance of above  $15^{\circ}\text{C}$  for 3 hours.

[Caution]

When still image is displayed for a period of 20 minutes or longer (especially where W/B scale is strong). Digital pattern 13ch and/or Cross hatch pattern 09ch, there can some afterimage in the black level area

## 3. Adjustment items

### 3.1. Final assembly adjustment

- EDID/DDC check
- White Balance adjustment
- ADC Adjustment check
- RS-232C functionality check
- Factory Option setting per destination
- Ship-out mode setting (In-Stop)

### 3.2. Etc

- Ship-out mode
- Tool option menu
- USB Download(S/W Update, Option, Service only)

## 3.3. Automatic Adjustment

### 3.3.1. Overview

ADC adjustment is needed to find the optimum black level and gain in Analog-to-Digital device and to compensate RGB deviation

### 3.3.2. Equipment & Condition

- 1) Jig (RS-232C protocol)
- 2) Inner Pattern
  - Resolution : 1080p (Inner Pattern)
  - Resolution : 1024\*768 RGB (Inner Pattern)
  - Pattern : Horizontal 100% Color Bar Pattern
  - Pattern level :  $0.7 \pm 0.1$  Vp-p

### 3.3.3 Adjustment

#### 3.3.3.1. Adjustment method

- Using RS-232, adjust items listed in 3.1 in the other shown in "4.1.3.3"

#### 3.3.3.2. Adj. protocol

Protocol	Command	Set ACK
Enter adj. mode	aa 00 00	a 00 OK00x
Source change	xb 00 40 xb 00 60	b 00 OK40x (Adjust 480i Comp1 ) b 00 OK60x (Adjust 1024*768 RGB)
Begin adj.	ad 00 10	
Return adj. result		OKx (Case of Success) NGx (Case of Fail)
Read adj. data	(main) ad 00 20  (sub ) ad 00 21	(main) 000000000000000000000000000000007c007b006dx  (Sub) 000000070000000000000000000000007c00830077x
Confirm adj.	ad 00 99	NG 03 00x (Fail) NG 03 01x (Fail) NG 03 02x (Fail) OK 03 03x (Success)
End adj.	aa 00 90	a 00 OK90x

#### 3.3.3.3 Adj. order

- aa 00 00 [Enter ADC adj. mode]
- xb 00 40 [Change input source to Component1(480i)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 60 [Change input source to RGB(1024\*768)]
- ad 00 10 [Adjust 1024\*768 RGB]
- ad 00 90 End adj.

Ref) ADC adj. RS232C Protocol\_Ver1.0

## 4. Manual Adjustment

### 4.1. MAC Address, ESN Key and Widevine Key download

#### 4.1.1. Equipment & Condition

- 1) Play file: keydownload.exe

#### 4.1.2. Communication Port connection

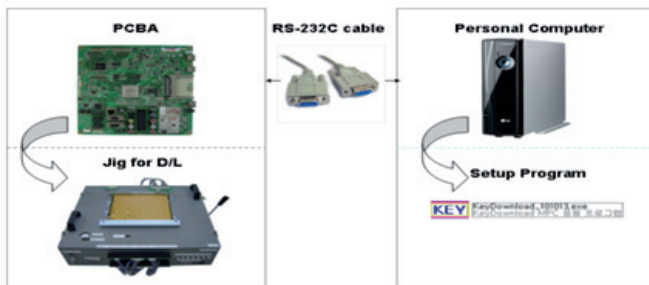
- 1) Key Write: Com 1,2,3,4 and 115200 (Baudrate)
- 2) Barcode: Com 1,2,3,4 and 9600 (Baudrate)

#### 4.1.3. Download process

- 1) Select the download items.
- 2) Mode check: Online Only
- 3) Check the test process
  - US, Canada models: DETECT -> MAC\_WRITE -> WIDEVINE\_WRITE
  - Korea, Mexico models: DETECT -> MAC\_WRITE -> WIDEVINE\_WRITE
- 4) Play : START
- 5) Check of result: Ready, Test, OK or NG
- 6) Printer out (MAC Address Label)

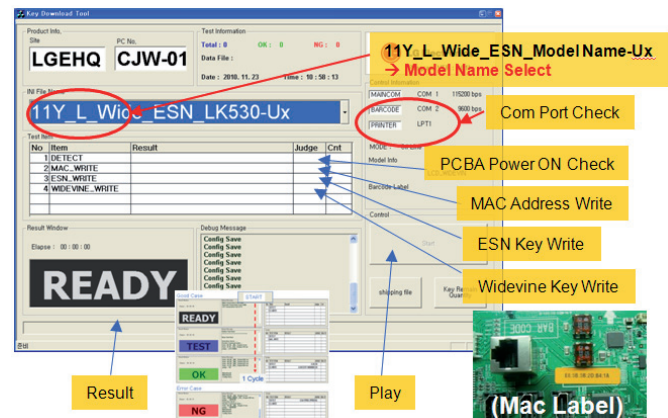
#### 4.1.4. Communication Port connection

- 1) Connect: PCBA Jig -> RS-232C Port == PC -> RS-232C Port

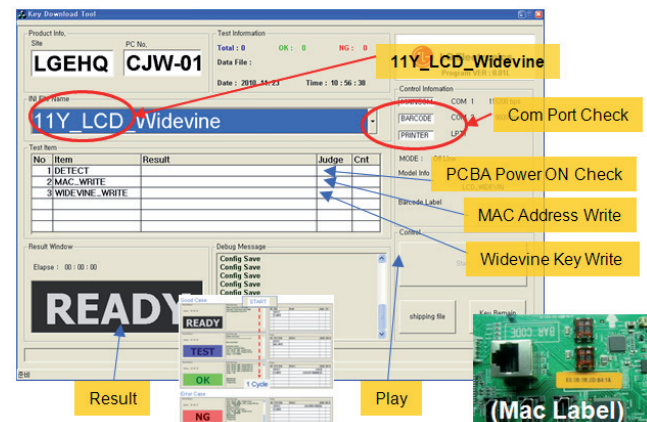


#### 4.1.5. Download

- 1) US, Canada, Mexico models (12Y LCD TV + MAC + Widevine + ESN Key)



- 2) Korea, Mexico models (11Y LCD TV + MAC + Widevine Only)



#### 4.1.6. Inspection

- In INSTANT menu, check these keys.

## 4.2. PING Test

\* LAN card can be verified by using PING test

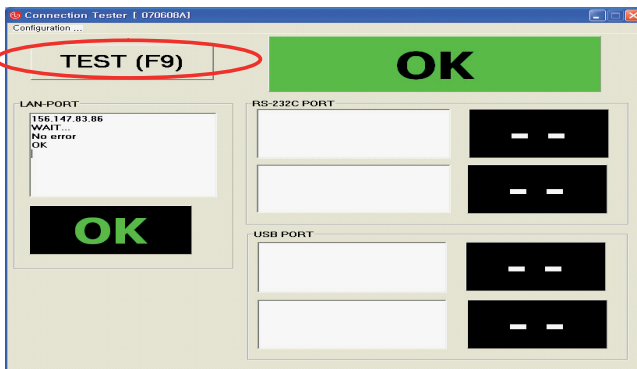
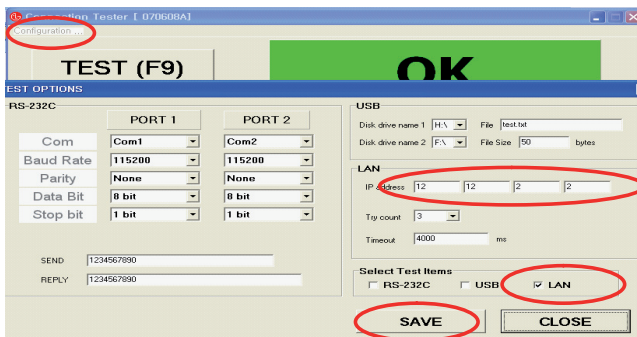
### 4.2.1 Adjustment Method(Board)

- 1) Connect LAN to the board and power on.  
(Default IP can be set to automatic setting. When power ON, IP can be automatically be achieved from the router)
- 2) Press ADJ key in the adjustment remote control.
- 3) Check Network status by pressing 13. ACAP PING TEST in EZ ADJUST. If it operates properly, it will show "Network is operating properly." If it does not, it will show "Network is not working properly."

### 4.2.2 Adjustment Method(Manufacturer)

- 4) Connect the PC with PING Test program installed and the LAN port of the SET via Cross LAN Cable. (The IP setting of the PC has to be 12.12.2.3)
- 5) After the PING Test program has been executed, check the program setting. (IP of the set will be 12.12.2.2. Double check the setting. Do not check the Modem because it will not be used.)
- 6) Press the Power Only Key in Adjustment remote control. (IP of the set will be set)
- 7) Upon pressing "RUN" in the program, it will show "OK" or "NG" according to the test result.

- After all the adjustments, to disable the IP setting, press INSTOP key.



## 4.3 EDID Download

### 4.3.1 Overview

- It is a VESA regulation. A PC or a MNT will display an optimal resolution through information sharing without any necessity of user input. It is a realization of "Plug and Play".

### 4.3.2 Equipment

- Since embedded EDID data is used, EDID download JIG, HDMI cable and D-sub cable are not need.
- Adjust remocon

### 4.3.3 Download method

- 1) Press Adj. key on the Adj. R/C,
- 2) Select EDID D/L menu.
- 3) By pressing Enter key, EDID download will begin
- 4) If Download is successful, OK is display, but If Download is failure, NG is displayed.
- 5) If Download is failure, Re-try downloads.

※ Caution) When EDID Download, must remove RGB/HDMI Cable.

#### 4.3.3.1. EDID DATA

# HDMI 1(C/S : 43 2C)

EDID Block 0, Bytes 0-127 [00H-7FH]

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 00 FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01
10 | 01 16 01 03 80 A0 5A 78 0A EE 91 A3 54 4C 99 26
20 | 0F 50 54 A1 08 00 31 40 45 40 61 40 71 40 81 80
30 | 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40 | 45 00 A0 5A 00 00 00 1E 66 21 50 B0 51 00 1B 30
50 | 40 70 36 00 A0 5A 00 00 00 1E 00 00 00 FD 00 39
60 | 3F 1F 52 10 00 0A 20 20 20 20 20 20 00 00 FC
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 01 43
```

EDID Block 1, Bytes 128-255 [80H-FFH]

0 1 2 3 4 5 6 7 8 9 A B C D E F

```
0 | 02 03 2E F1 48 90 22 20 05 04 03 02 01 23 09 57
10 | 07 78 03 0C 00 10 00 B8 2D 20 C0 0E 01 4F 00 FE
20 | 08 10 06 10 18 10 28 10 38 10 E3 05 03 01 02 3A
30 | 80 18 71 38 2D 40 58 2C 45 00 A0 5A 00 00 00 1E
40 | 01 1D 80 18 71 1C 16 20 58 2C 25 00 A0 5A 00 00
50 | 00 9E 01 1D 00 72 51 D0 1E 20 6E 28 55 00 A0 5A
60 | 00 00 00 1E 26 36 80 A0 70 38 1F 40 30 20 25 00
70 | A0 5A 00 00 00 1A 00 00 00 00 00 00 00 00 2C
```

# HDMI 2(C/S : 43 1C)  
EDID Block 0, Bytes 0-127 [00H-7FH]

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0		00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10		01	16	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20		0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30		01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40		45	00	A0	5A	00	00	00	1E	66	21	50	B0	51	00	1B	30
50		40	70	36	00	A0	5A	00	00	00	1E	00	00	00	FD	00	39
60		3F	1F	52	10	00	0A	20	20	20	20	20	20	20	00	00	FC
70		00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	43

EDID Block 1, Bytes 128-255 [80H-FFH]

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0		02	03	2E	F1	48	90	22	20	05	04	03	02	01	23	09	57
10		07	78	03	0C	00	10	00	B8	3D	20	C0	0E	01	4F	00	FE
20		08	10	06	10	18	10	28	10	38	10	E3	05	03	01	02	3A
30		80	18	71	38	2D	40	58	2C	45	00	A0	5A	00	00	00	1E
40		01	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
50		00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	A0	5A
60		00	00	00	1E	26	36	80	A0	70	38	1F	40	30	20	25	00
70		A0	5A	00	00	00	1A	00	00	00	00	00	00	00	00	00	1C

# HDMI 3(C/S : 43 0C)  
EDID Block 0, Bytes 0-127 [00H-7FH]

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0		00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10		01	16	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20		0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30		01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40		45	00	A0	5A	00	00	00	1E	66	21	50	B0	51	00	1B	30
50		40	70	36	00	A0	5A	00	00	00	1E	00	00	00	FD	00	39
60		3F	1F	52	10	00	0A	20	20	20	20	20	20	20	00	00	FC
70		00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	43

EDID Block 1, Bytes 128-255 [80H-FFH]

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0		02	03	2E	F1	48	90	22	20	05	04	03	02	01	23	09	57
10		07	78	03	0C	00	10	00	B8	4D	20	C0	0E	01	4F	00	FE
20		08	10	06	10	18	10	28	10	38	10	E3	05	03	01	02	3A
30		80	18	71	38	2D	40	58	2C	45	00	A0	5A	00	00	00	1E
40		01	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
50		00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	A0	5A
60		00	00	00	1E	26	36	80	A0	70	38	1F	40	30	20	25	00
70		A0	5A	00	00	00	1A	00	00	00	00	00	00	00	00	00	0C

# HDMI 4(C/S : 43 FC)  
EDID Block 0, Bytes 0-127 [00H-7FH]

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0		00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10		01	16	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20		0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30		01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40		45	00	A0	5A	00	00	00	1E	66	21	50	B0	51	00	1B	30
50		40	70	36	00	A0	5A	00	00	00	1E	00	00	00	FD	00	39
60		3F	1F	52	10	00	0A	20	20	20	20	20	20	20	00	00	FC
70		00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	43

EDID Block 1, Bytes 128-255 [80H-FFH]

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0		02	03	2E	F1	48	90	22	20	05	04	03	02	01	23	09	57
10		07	78	03	0C	00	10	00	B8	5D	20	C0	0E	01	4F	00	FE
20		08	10	06	10	18	10	28	10	38	10	E3	05	03	01	02	3A
30		80	18	71	38	2D	40	58	2C	45	00	A0	5A	00	00	00	1E
40		01	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
50		00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	A0	5A
60		00	00	00	1E	26	36	80	A0	70	38	1F	40	30	20	25	00
70		A0	5A	00	00	00	1A	00	00	00	00	00	00	00	00	00	FC

# RGB(C/S : 5C)  
EDID Block 0, Bytes 0-127 [00H-7FH]

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0		00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10		01	16	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20		0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30		01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40		45	00	A0	5A	00	00	00	1E	66	21	50	B0	51	00	1B	30
50		40	70	36	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60		3E	1E	53	10	00	0A	20	20	20	20	20	20	20	00	00	FC
70		00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	00	5C

## 4.4. White Balance Adjustment

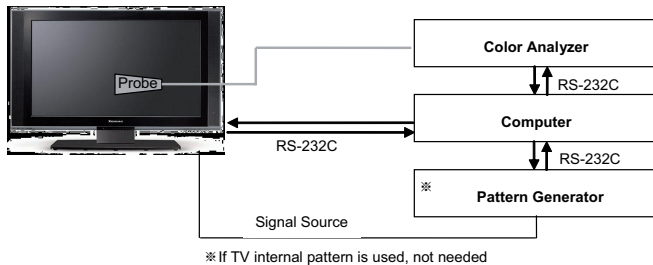
### 4.4.1. Overview

- W/B adj. Objective & How-it-works
- (1) Objective: To reduce each Panel's W/B deviation
- (2) How-it-works: When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.
- (3) Adj. condition: normal temperature
  - Surrounding Temperature: 25±5 °C
  - Warm-up time: About 5 Min
  - Surrounding Humidity: 20% ~ 80%

### 4.4.2. Equipment

- (1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14)
  - (2) Adj. Computer (During auto adj., RS-232C protocol is needed)
  - (3) Adjust Remocon
  - (4) Video Signal Generator MSPG-925F 720p/204-Gray (Model: 217, Pattern: 49)
- ※ Color Analyzer Matrix should be calibrated using CS-1000

### 4.4.3. Equipment connection



### 4.4.4. Adjustment Command (Protocol)

- (1) RS-232C Command used during auto-adj.

RS-232C COMMAND			Explanation
CMD	DATA	ID	
Wb	00	00	Begin White Balance adj.
Wb	00	ff	End White Balance adj. (internal pattern disappears )

- (2) Adjustment Map

	Adj. item	Command (lower caseASCII)		Data Range (Hex.)	
		CMD1	CMD2	MIN	MAX
Cool	R Gain	j	g	00	C0
	G Gain	j	h	00	C0
	B Gain	j	i	00	C0
Medium	R Gain	j	a	00	C0
	G Gain	j	b	00	C0
	B Gain	j	c	00	C0
Warm	R Gain	j	d	00	C0
	G Gain	j	e	00	C0
	B Gain	j	f	00	C0

### 4.4.5. Adj. method

#### 4.4.5.1. Auto adj. method

- (1) Set TV in ADJ mode using P-ONLY key (or POWER ON key)
  - (2) Place optical probe on the center of the display
    - It need to check probe condition of zero calibration before adjustment.
  - (3) Connect RS-232C Cable
  - (4) Select mode in ADJ Program and begin a adjustment.
  - (5) When WB adjustment is completed with OK message, check adjustment status of pre-set mode (Cool, Medium, Warm)
  - (6) Remove probe and RS-232C cable.
- W/B Adj. must begin as start command "wb 00 00" , and finish as end command "wb 00 ff", and Adj. offset if need

#### 4.4.5.2. Manual adj. method

- (1) Set TV in Adj. mode using POWER ON
- (2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface..
- (3) Press ADJ key -> EZ adjust using adj. R/C -> 9. White-Balance then press the cursor to the right (KEY▶). When KEY(▶) is pressed 216 Gray internal pattern will be displayed.
- (4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
- (5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

- If internal pattern is not available, use RF input. In EZ Adj. menu 6.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner (ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.

#### ▪ Adj. condition and cautionary items

- (1) Lighting condition in surrounding area
  - Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
- (2) Probe location: Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~100°)
- (3) Aging time
  - After Aging Start, Keep the Power ON status during 5 Minutes.
  - In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

#### 4.4.6. Reference (White Balance Adj. coordinate and color temperature)

- Luminance: 204 Gray
- Standard color coordinate and temperature using CS-1000 (over 26 inch)

Mode	Coordinate		Temp	$\Delta uv$
	X	Y		
Cool	0.269	0.273	13,000K	0.0000
Medium	0.285	0.293	9,300K	0.0000
Warm	0.313	0.329	6,500K	+0.0030

- Standard color coordinate and temperature using CA-210(CH 18) - ALEF

Mode	Coordinate		Temp	$\Delta uv$
	X	Y		
Cool	0.269±0.002	0.273±0.002	13,000K	0.0000
Medium	0.285±0.002	0.293±0.002	9,300K	0.0000
Warm	0.313±0.002	0.329±0.002	6,500K	+0.0030

- Standard color coordinate and temperature using CA-210(CH 14) - LGD

Mode	Coordinate		Temp	$\Delta uv$
	X	Y		
Cool	0.269±0.002	0.273±0.002	13,000K	0.0000
Medium	0.285±0.002	0.293±0.002	9,300K	0.0000
Warm	0.313±0.002	0.329±0.002	6,500K	0.0000

##### 4.4.6.1 ALEF&EDGE LED&IOL White balance table

- Edge LED module change color coordinate because of aging time
- apply under the color coordinate table, for compensated aging time **Edge (LM860X)**

GP4	Aging time (Min)	Cool		Medium		Warm	
		X	Y	X	Y	X	Y
		269	273	285	293	313	329
1	0-2	283	293	299	313	320	339
2	3-5	282	291	298	311	319	337
3	6-9	281	290	297	310	318	336
4	10-19	279	289	295	309	316	335
5	20-35	277	284	293	304	314	330
6	36-49	274	279	290	299	311	325
7	50-79	271	277	287	297	308	323
8	80-149	270	274	286	294	307	320
9	Over 150	269	273	285	293	306	319

#### 4.4.7 THX Adjustment (For US Models)

For THX models, White Balance 4 point automatic control can be done through the below steps. (Warm axis)

(1) 100 IRE White Balance Adjustment done.

(2) Control Backlight so the Maximum brightness

\*In case of 100 IRE adjustment, backlight target value is 125cd/m2.

(3) 4 Point gamma and W/B adjustment done.

\*With the controlled maximum brightness, adjust the Gamma 2.2 (60, 40, and 20 IRE / do not adjust at 80 IRE)

\*For 10 IRE, set R, G, B gain to 0, 0, and 0, respectively.

#### 4.5. Option selection per country

##### 4.5.1. Overview

- (1) Press ADJ key on the Adj. R/C, and then select Country Group Menu.
- (2) Depending on destination, select KR or US, then on the lower Country option, select US, CA, MX. Selection is done using +, - KEY

#### 4.6. Tool Option Inspection

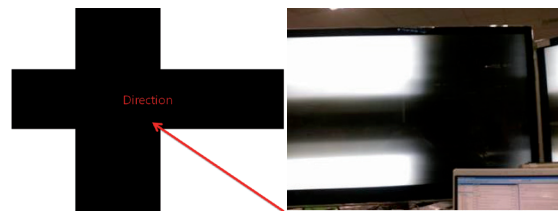
- Method: Press Adj. key on the Adj. R/C, then select Tool option.

Model	Tool 1	Tool 2	Tool 3	Tool 4	Tool 5	Tool 6	Tool 7
47LM9600-UC	32999	45122	30605	20527	55823	1324	63115
55LM9600-UC	33001	45122	30605	20527	55823	1324	63115

#### 4.7. Local Dimming Inspection (Optional)

##### 4.7.1. ALEF models with local dimming

- (1) Press 'TILT' key of the Adj. R/C and check moving patterns. The black bar patterns moves from top to bottom. If a local dimming function does not work, a whole screen shows full white



#### 4.8. Ship-out mode check (In-stop)

- After final inspection, press In-Stop key of the Adj. R/C and check that the unit goes to Stand-by mode.
- After final inspection, Always turn on the Mechanical S/W.

#### 4.9. WIFI MAC ADDRESS CHECK

a. Using RS232

	Command	Set ACK
Transmission	[A][I][Set ID][20][Cr]	[O][K][x] or [N][G]

b. check the menu on in-start



Note that there are Wi-Fi MAC and MAC address.

Wi-Fi MAC is used for wireless network and MAC address is used for wired network

## 5. GND and Internal Pressure check

### 5.1. Method

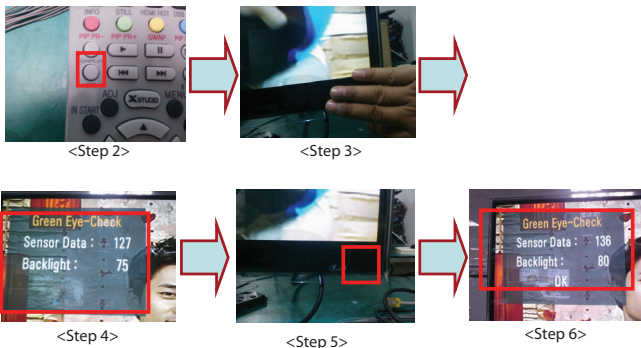
- (1) GND & Internal Pressure auto-check preparation
  - Check that Power Cord is fully inserted to the SET.  
(If loose, re-insert)
- (2) Perform GND & Internal Pressure auto-check
  - Unit fully inserted Power cord; Antenna cable and A/V arrive to the auto-check process.
  - Connect D-terminal to AV JACK TESTER
  - Auto CONTROLLER (GWS103-4) ON
  - Perform GND TEST
  - If NG, Buzzer will sound to inform the operator.
  - If OK, changeover to I/P check automatically.  
(Remove CORD, A/V form AV JACK BOX)
  - Perform I/P test
  - If NG, Buzzer will sound to inform the operator.
  - If OK, Good lamp will lit up and the stopper will allow the pallet to move on to next process.

### 5.2. Checkpoint

- (1) Test voltage
  - GND: 1.5KV/min at 100mA
  - SIGNAL: 3KV/min at 100mA
- (2) TEST time: 1 second
- (3) TEST POINT
  - GND Test = POWER CORD GND and SIGNAL CABLE GND.
  - Hi-pot Test = POWER CORD GND and LIVE & NEUTRAL.
- (4) LEAKAGE CURRENT: At 0.5mArms

## 6. EYE-Q Operation check

- Step 1) Turn on the TV..
- Step 2) Press 'EYE' button' on the adjustment remote-controller.
- Step 3) Cover 'Eye Q sensor' on the front of set with your hands, hold it for 6 seconds.
- Step 4) Check "the Sensor Data" on the screen, make certain that Data is below 10. If Data isn't below 10 in 6 seconds, Eye Q sensor would be bad. You should change Eye Q sensor.
- Step 5) Uncover your hands from Eye Q sensor, hold it for 6 seconds.
- Step 6) Check "Back Light(XXX)" on the screen, check data increase . You should change Eye Q sensor.



## 7. Magic Motion Remote Control Inspection

- Required Instruments: Inspection RF-remote control, Inspection IR-KEY-CODE remote control.
- Prior to the test, AA battery for the RF-remote control should be adequate.  
(Change the battery for each LOT is recommended)
- Test procedures
  - (1) Press the 'START' key on the controller to pair with the set.
  - (2) Press the 'OK' key in the controller and check whether the cursor appears on the set.
  - (3) Press 'Vol+ (STOP)' key to de-pair with the set.

## 8. 3D function test

### 8.1 Test equipment

- (1) Pattern Generator MSHG-600 or MSPG-6100 (HDMI 1.4 support)
- (2) Pattern: HDMI mode (model No. 872, pattern No. 83)

### 8.2 Test method

- (1) Input 3D test signal as Fig.1.



Fig.1

<HDMI Mode 872번, Pattern No. 83>

- (2) Press 'OK' key as a 3D input OSD is shown.
- (3) Check pattern as Fig2 without 3D glasses. (3D mode without 3D glasses)



Fig.2

<OK in 3D mode without 3D glasses>

## 9. HDMI ARC Function Inspection

### 9.1. Test equipment

- Optic Receiver Speaker
- MSHG-600 (SW: 1220 ↑)
- HDMI Cable (for 1.4 version)

### 9.2 Test method

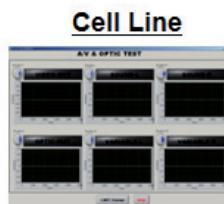
- (1) Insert the HDMI Cable to the HDMI ARC port from the master equipment (HDMI1)



- (2) Check the sound from the TV Set



- (3) Check the Sound from the Speaker or using AV & Optic TEST program (It's connected to MSHG-600)



- \* Remark: Inspect in Power Only Mode and check SW version in a master equipment



## 10. USB S/W Download

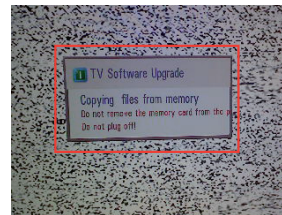
### (optional, Service only)

- (1) Put the USB Stick to the USB socket
- (2) Automatically detecting update file in USB Stick
  - If your downloaded program version in USB Stick is lower than that of TV set, it didn't work. Otherwise USB data is automatically detected.
- (3) Show the message "Copying files from memory"
- (5) Updating Completed, The TV will restart automatically
- (6) If your TV is turned on, check your updated version and Tool option.

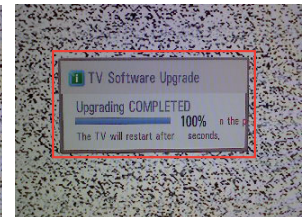
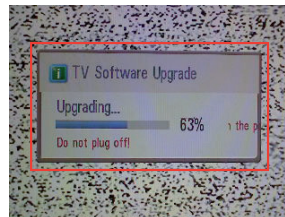
\* If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. If all channel data is cleared, you didn't have a DTV/ATV test on production line.

\* After downloading, TOOL OPTION setting is needed again.

- (1) Push "IN-START" key in service remote controller.
- (2) Select "Tool Option 1" and Push "OK" button.
- (3) Punch in the number. (Each model has their number.)



- (4) Updating is starting.



- (5) Updating Completed, The TV will restart automatically
- (6) If your TV is turned on, check your updated version and Tool option.

\* If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. If all channel data is cleared, you didn't have a DTV/ATV test on production line.

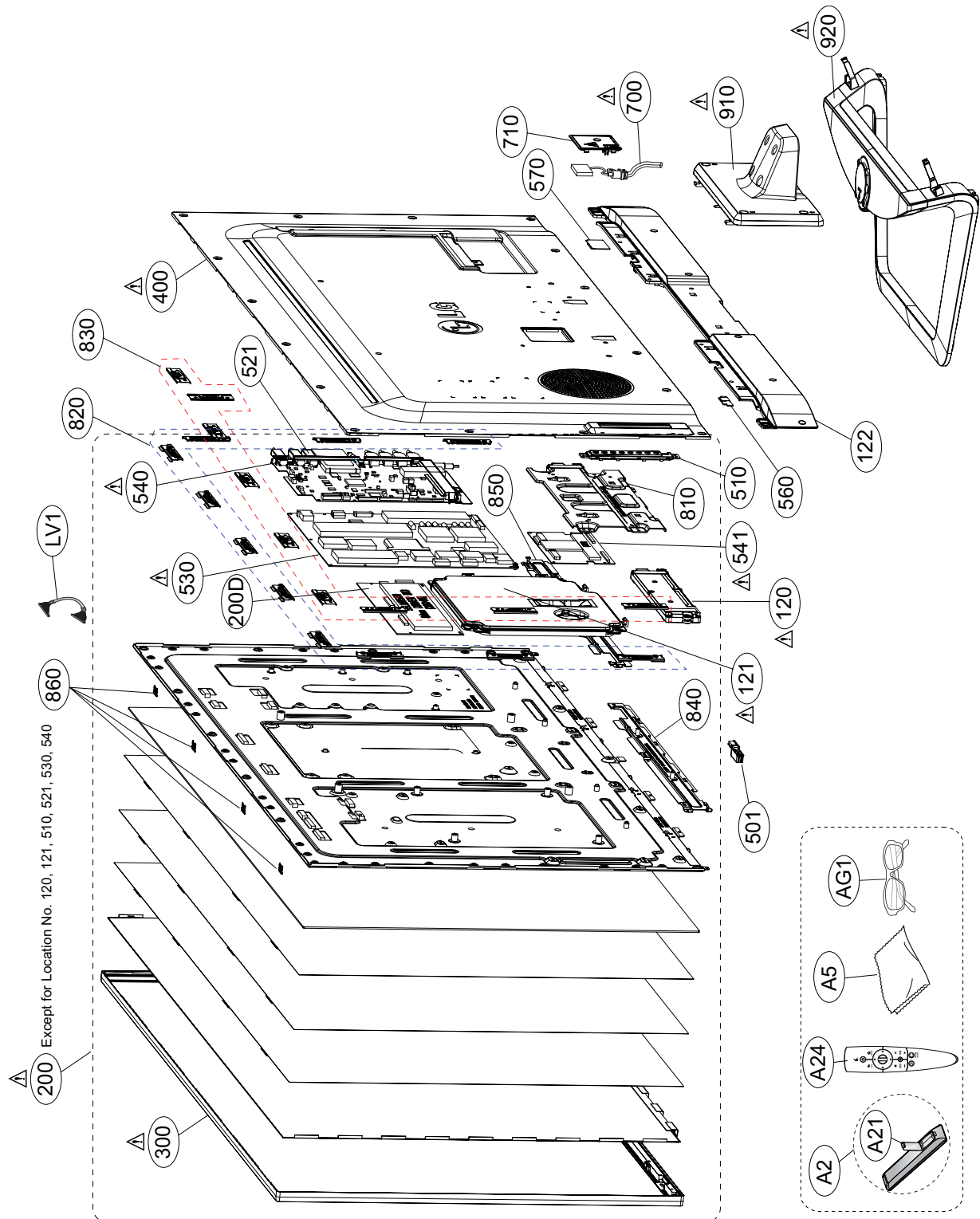
\* After downloading, TOOL OPTION setting is needed again.

- (1) Push "IN-START" key in service remote controller.
- (2) Select "Tool Option 1" and Push "OK" button.
- (3) Punch in the number. (Each model has their number.)

# EXPLODED VIEW

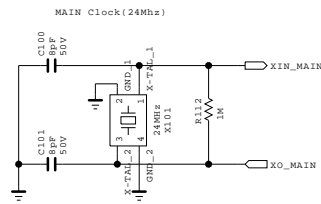
## IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by  $\Delta$  in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.



## System Configuration

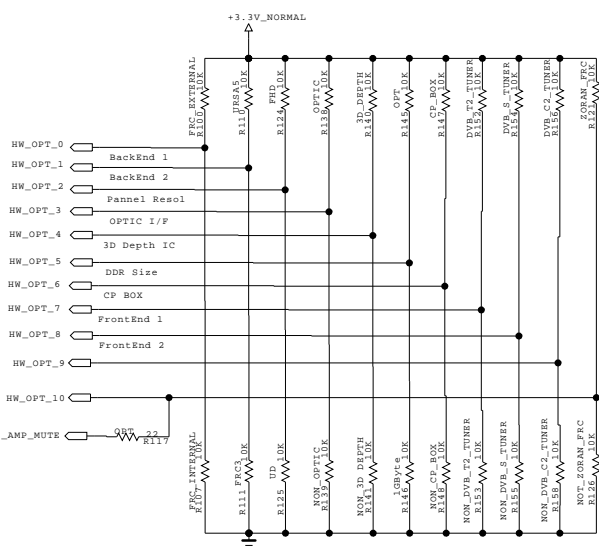
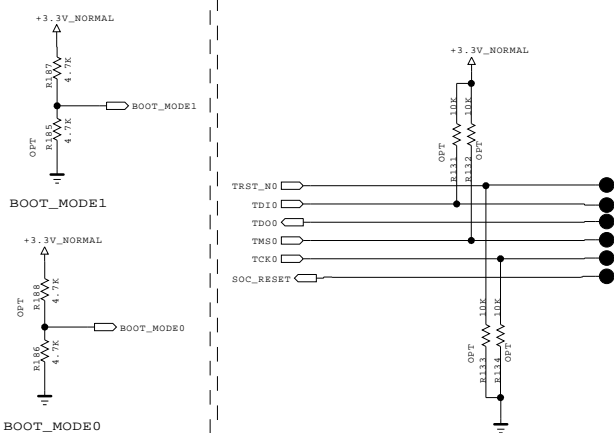
## Clock for LG1152



```
PLL SET[1:0] ==> Internal Pull-UP. N.C is high
00 : CPU clock(1056Mhz), Main0,1/2 DDR (792/792 Mhz)
01 : CPU clock(792Mhz), Main0,1/2 DDR (672/792 Mhz)
10 : CPU clock(1152Mhz), Main0,1/2 DDR (792/672 Mhz)
11 : CPU clock(984Mhz), Main0,1/2 DDR (792/792 Mhz)
```



## JTAG I/F FOR MAIN



	NO_FRC	SoC internal FRC	LG FRC3	URSA5
MODEL_OPT_0	0	0	1	1
MODEL_OPT_1	0	1	0	1

		HIGH	LOW
MODEL_OPT_2		FHD	UD
MODEL_OPT_3		OPTIC	NON_OPTIC
MODEL_OPT_4	3D DEPTH	3D_Depth_IC	NON_3D_Depth
MODEL_OPT_5	DDR	Reserved	DDR_Default
MODEL_OPT_6	CP BOX	Enable	Disable
MODEL_OPT_7	T2 Tuner	Support	Not Support
MODEL_OPT_8	S Tuner	Support	Not Support
MODEL_OPT_9	C2 Tuner	Support	Not Support
MODEL_OPT_10	Zoran FRC	Support	Not Support

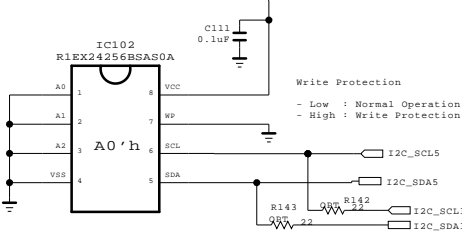
MODEL OPTION 8 is just for CP Box  
It should not be applied at MP

SECRET

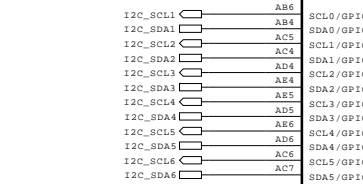
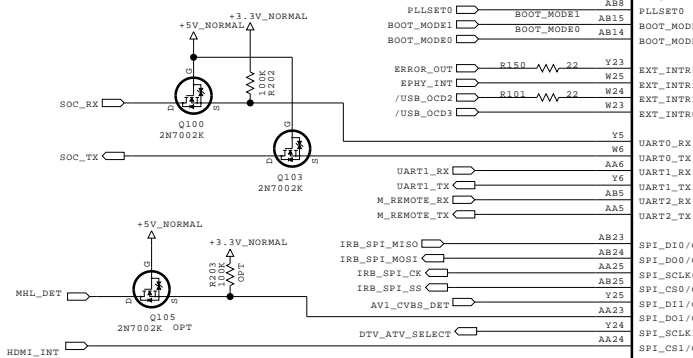
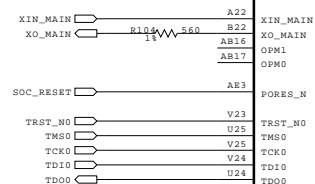
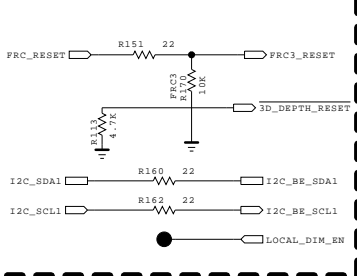
LG Electronics



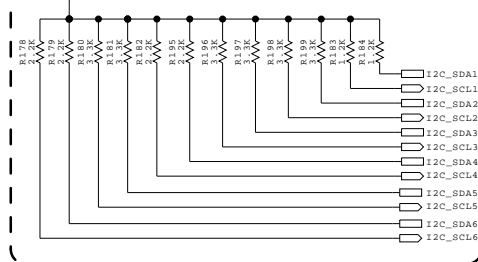
## NVRAM



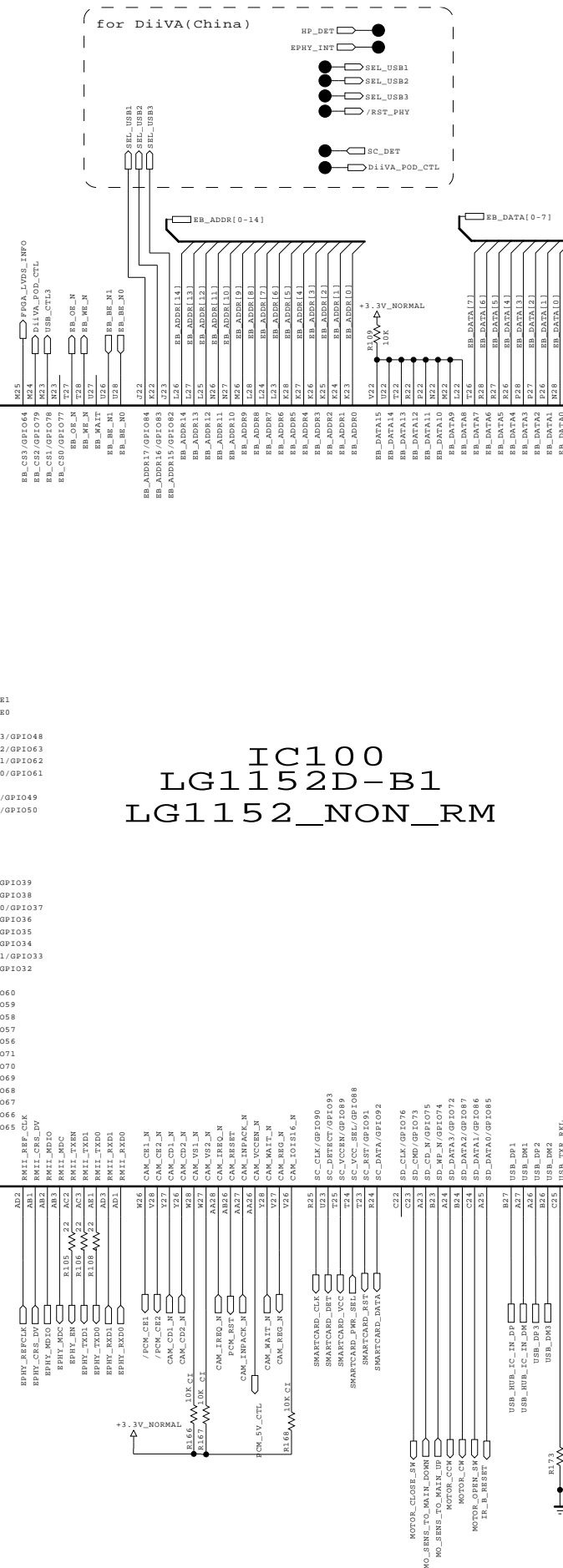
## Place to LVDS Wafer



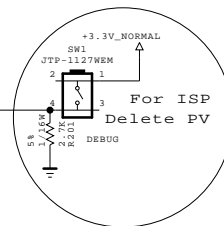
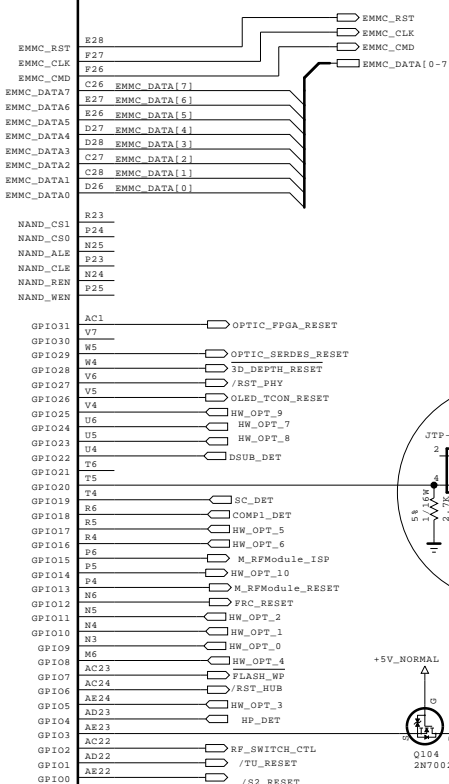
## I2C PULL UP



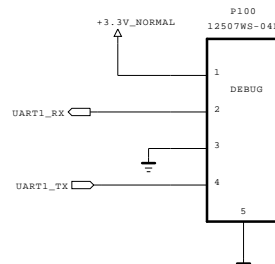
IC100  
LG1152D-B1  
LG1152\_NON\_RM





LG1152\_RM  
IC100-\*1



## Debug

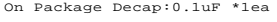
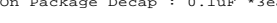
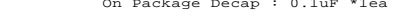
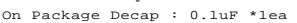
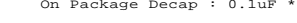
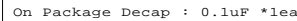
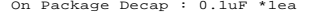
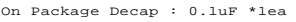
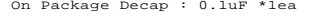
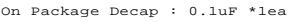
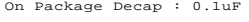
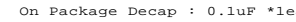
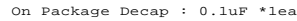
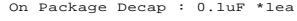
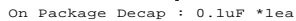
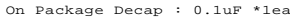
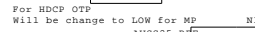


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

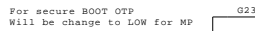
Place near Jack side

MODEL	LG1152 B1	DATE	
BLOCK	MAIN & GPIO	SHEET	1 /

IC101  
LG1152AN-B2



IC100  
LG1152D-B1



⚠

LG Electronics

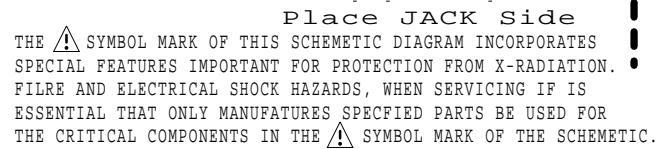


BLOCK

## MAIN POWER

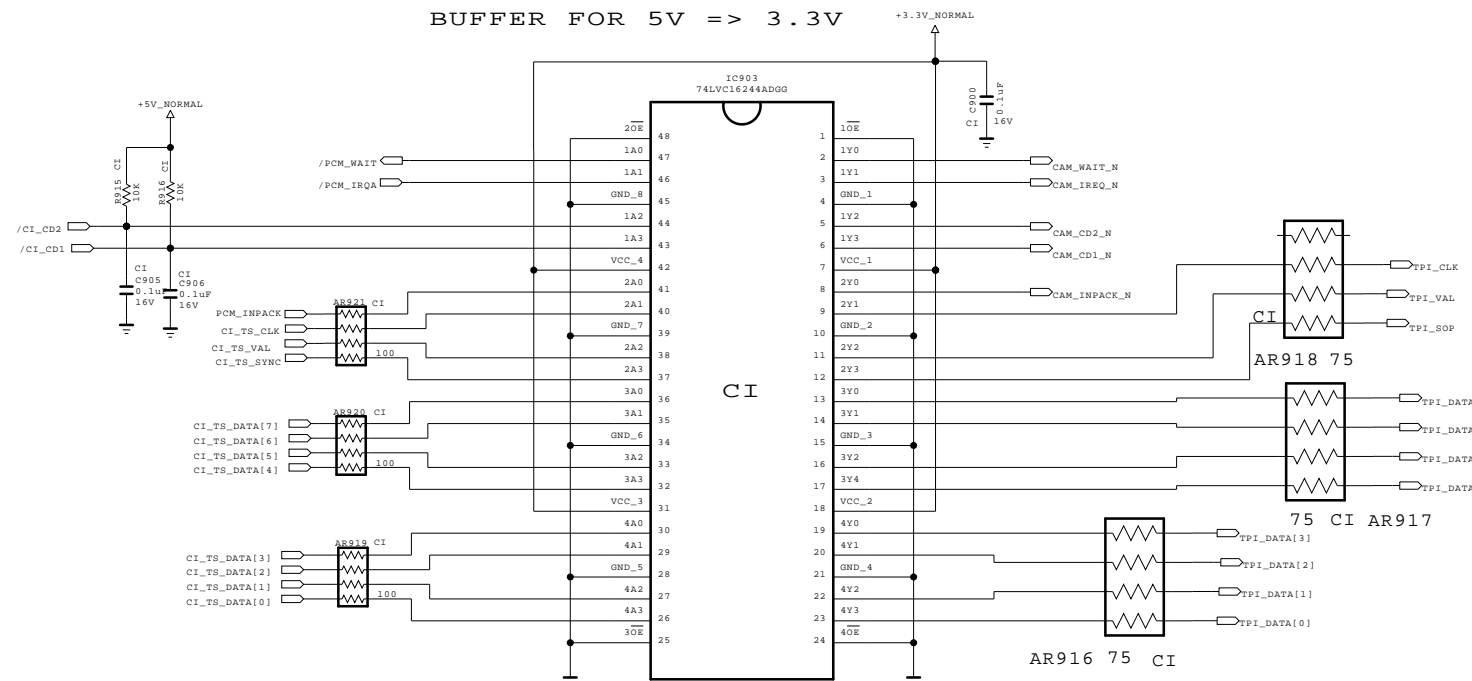
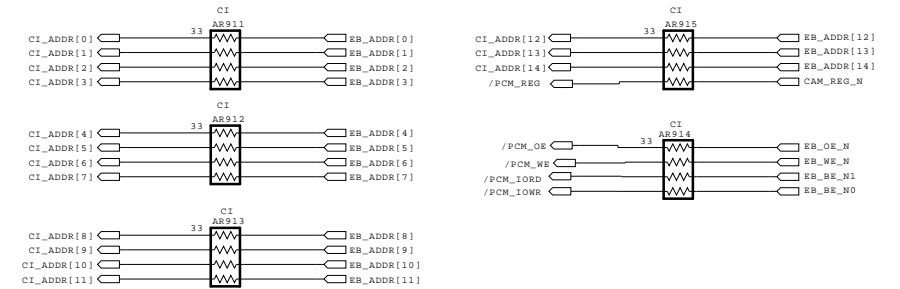
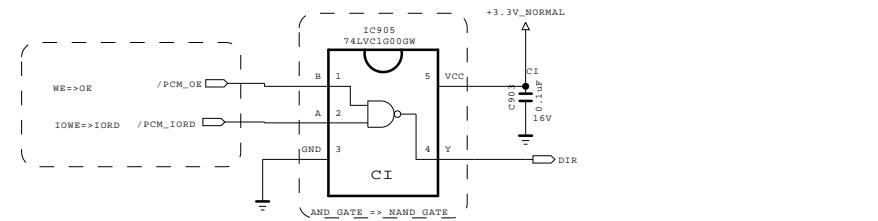
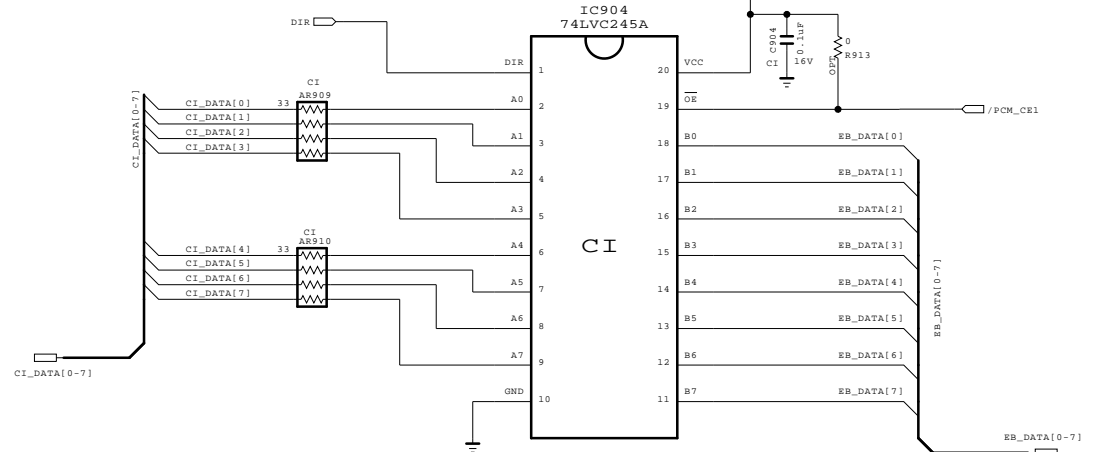
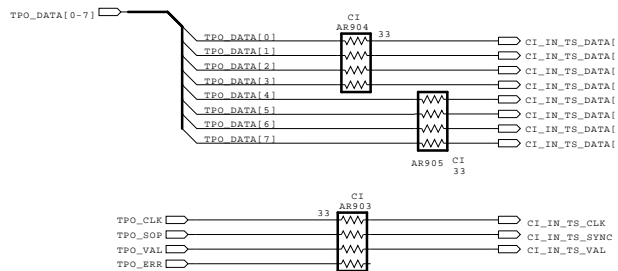
SHEET

3



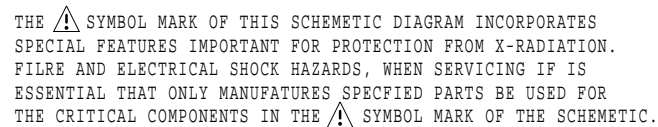
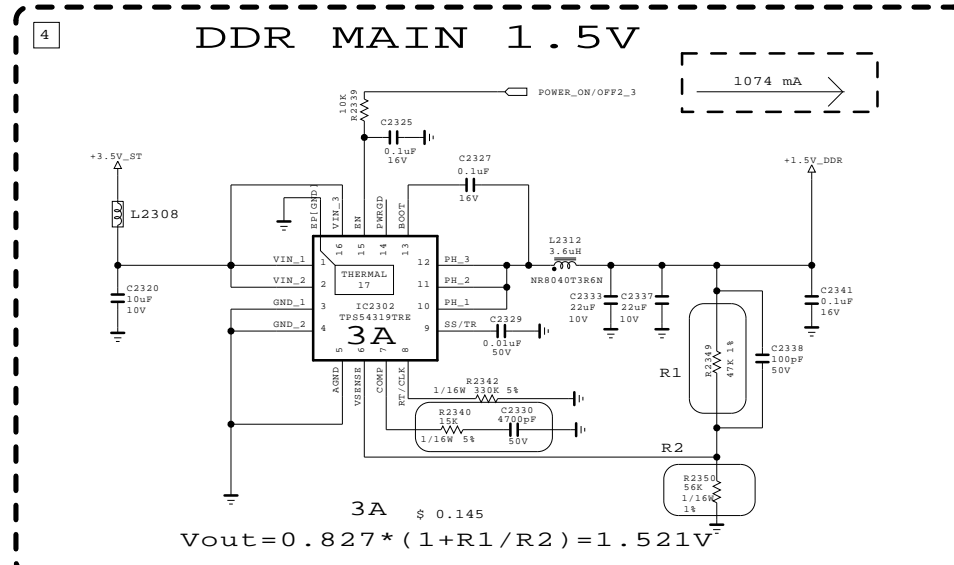
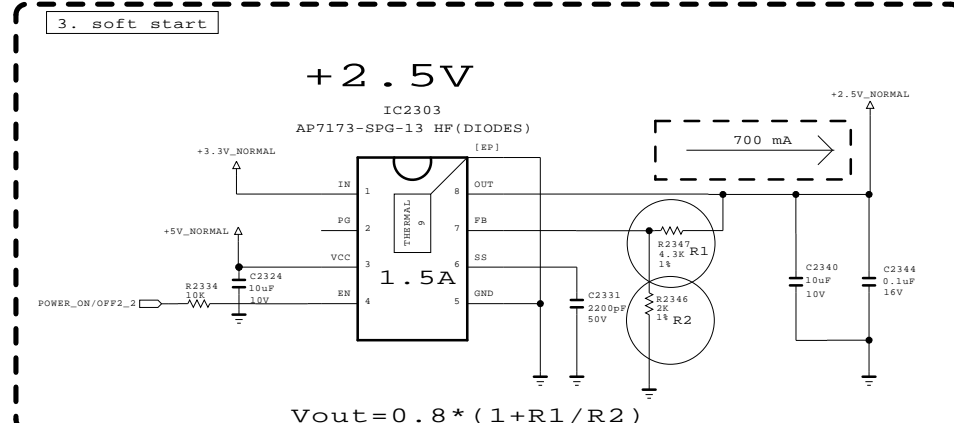
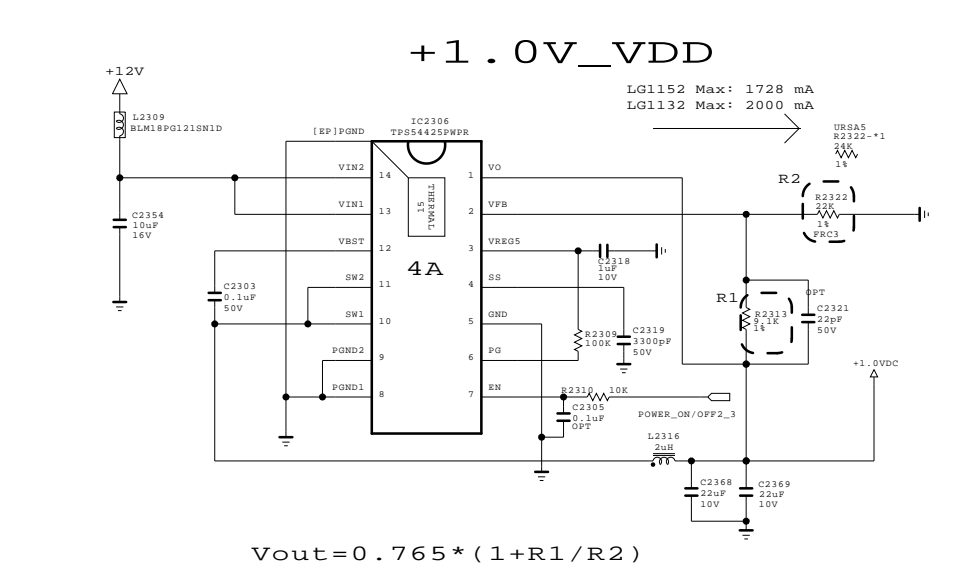
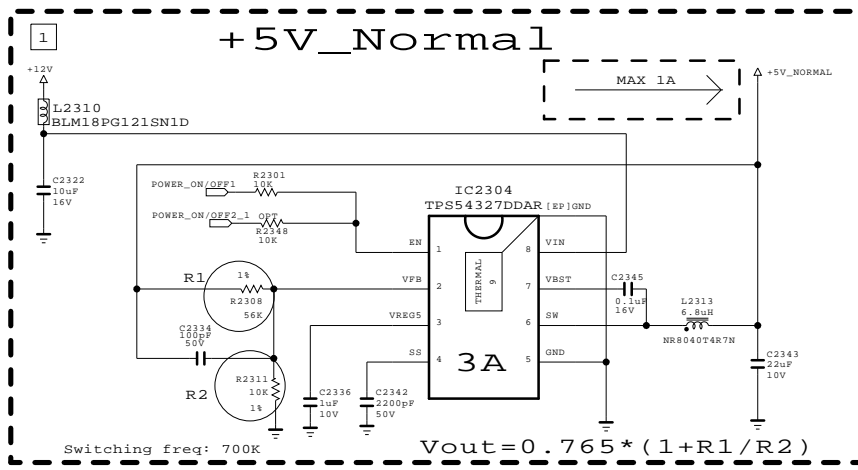
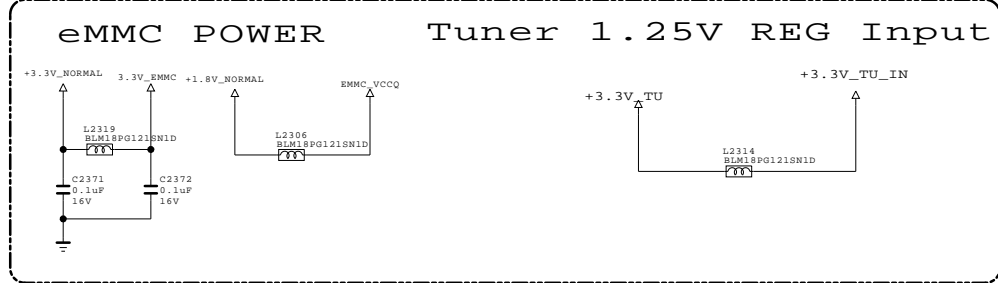
MODEL	LG1152 B0	DATE	
BLOCK	MAIN AUDIO/VIDEO	SHEET	3 /





SECRET  
LGElectronics

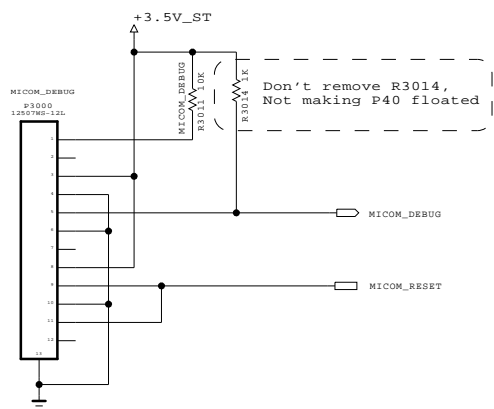




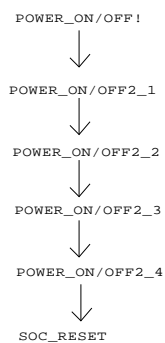
MODEL	LG1152	DATE	
BLOCK	POWER	SHEET	/

## Renesas MICOM

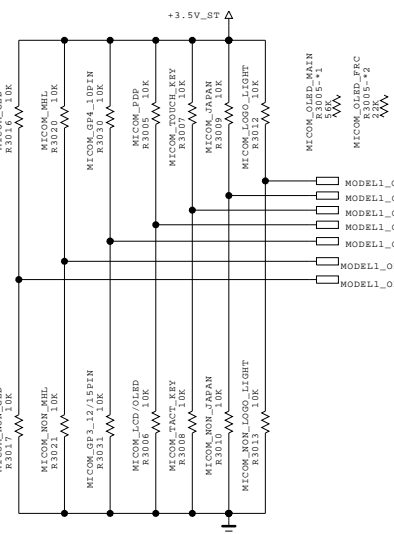
For Debug



## GP4 High/MID Power SEQUENCE





## MICOM MODEL OPTION

MICOM MODEL OPTION

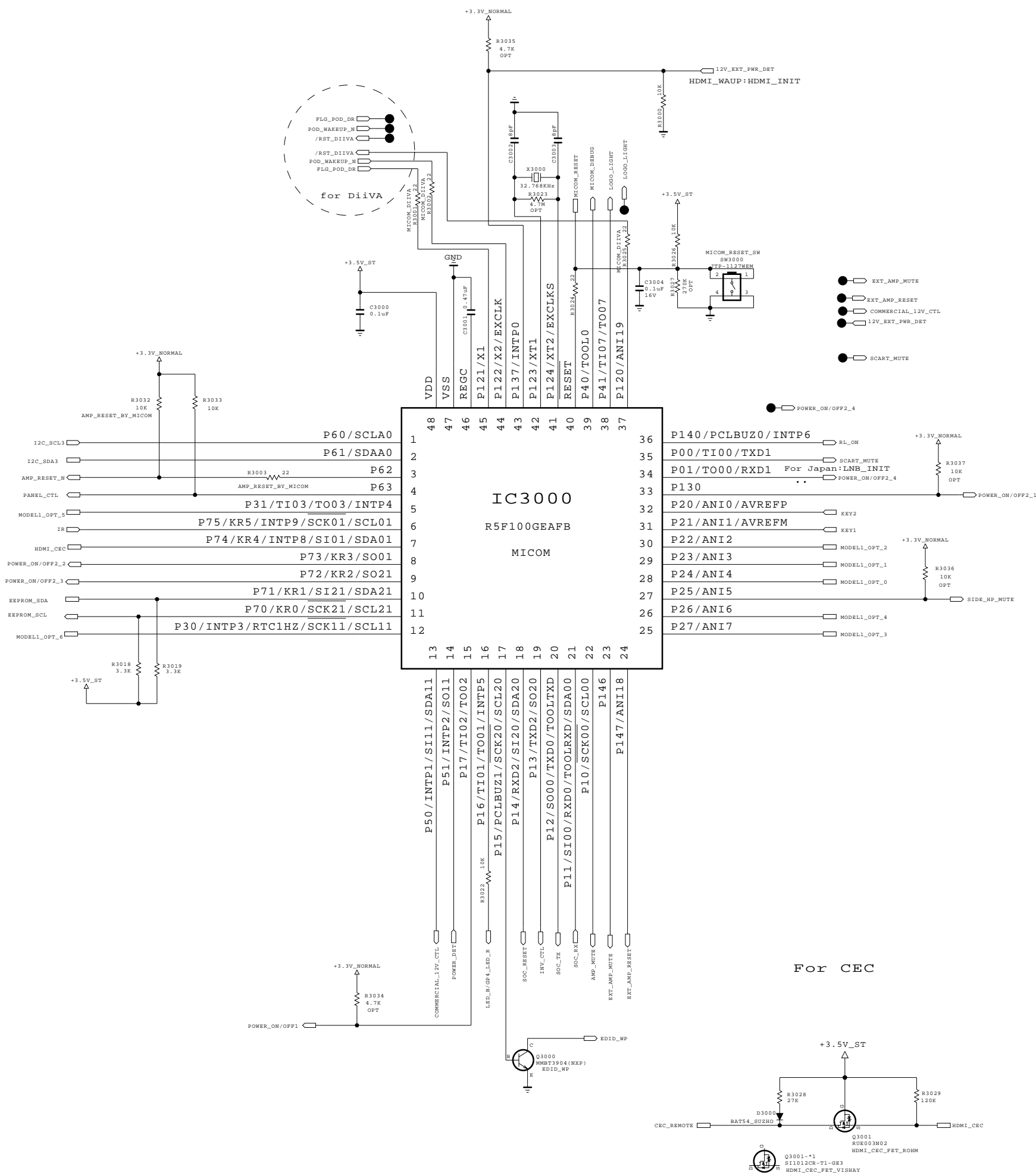
	0	1	
MODEL_OPT_0	NON LOGO_LIGHT	LOGO_LIGHT	For LM86
MODEL_OPT_1	NON JAPAN	JAPAN	For JAPAN
MODEL_OPT_2	TACT_KEY	TOUCH_KEY	
MODEL_OPT_3	LCD / OLED	PDP	
MODEL_OPT_4	IR Wafer 12/15Pin (GP3_Soft touchb)	IR Wafer 10Pin (GP4_TOOL)	For Sample Set
MODEL_OPT_5	NON_MHL	MHL	GP4_HIGH
MODEL_OPT_6	NON_GED	GED	

## Eye Sensor Option

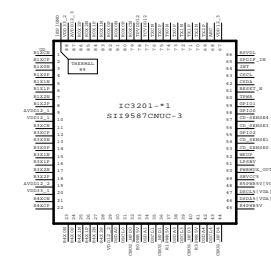
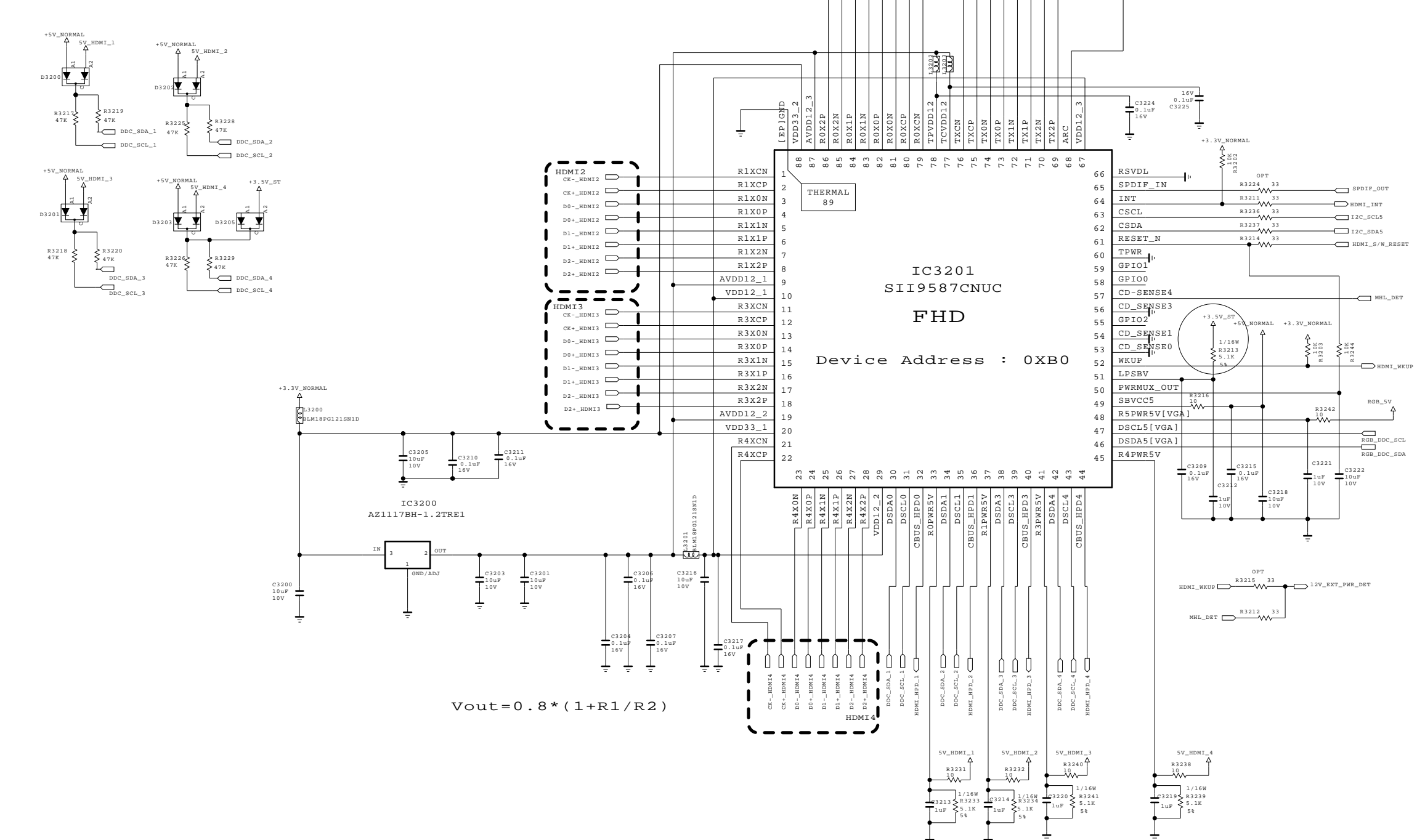
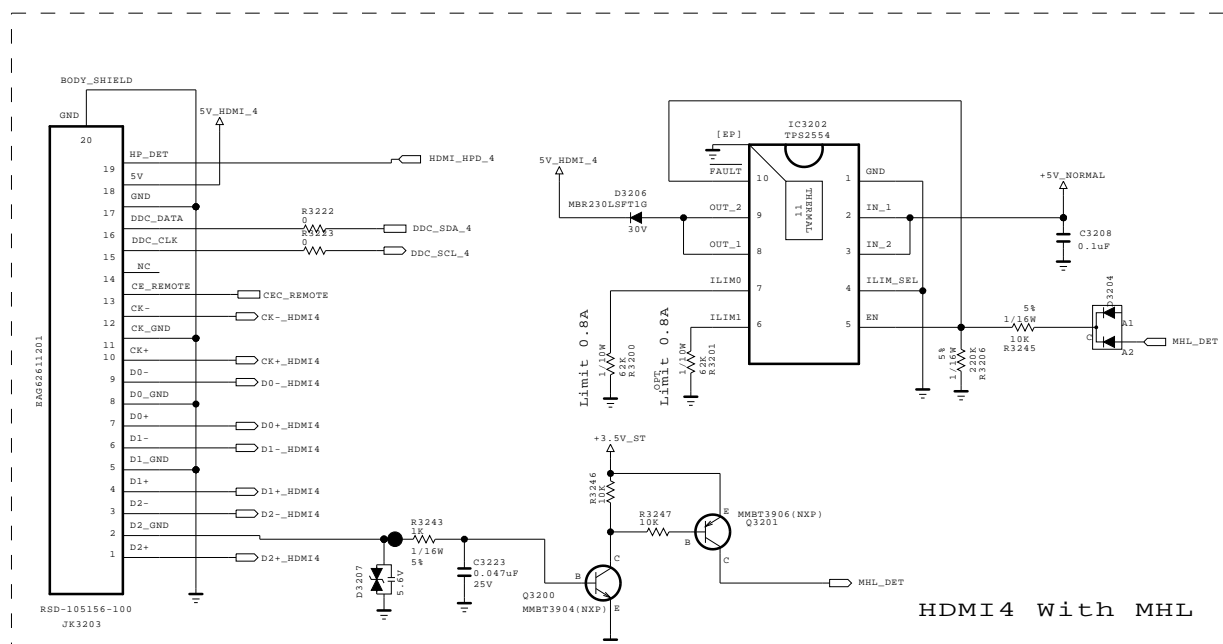
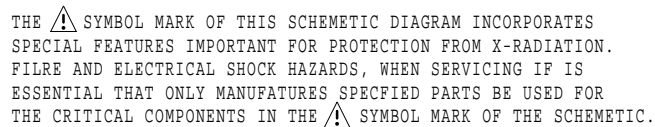
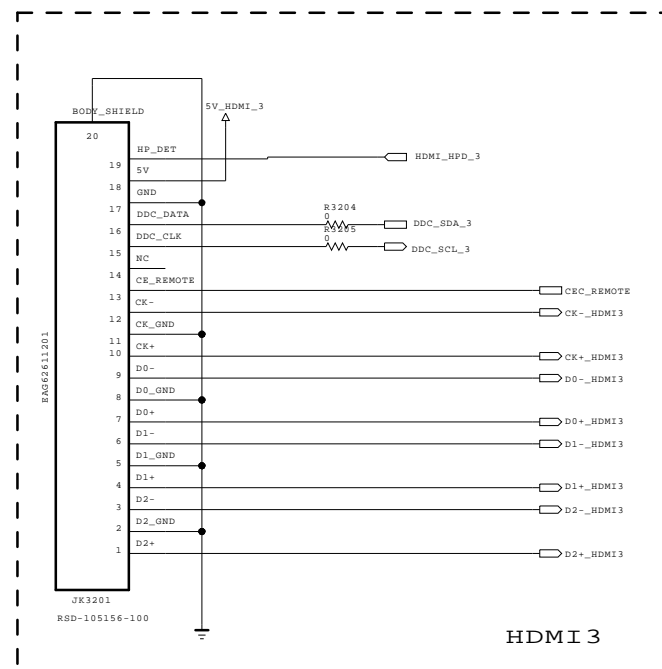
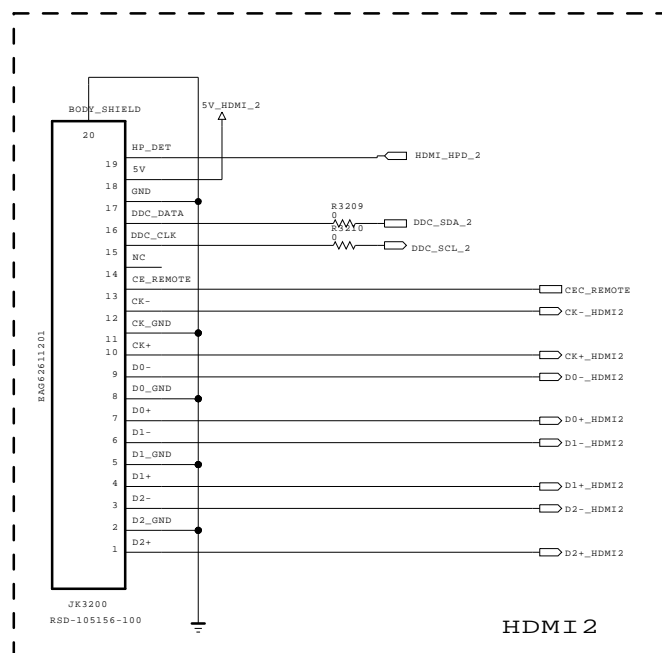
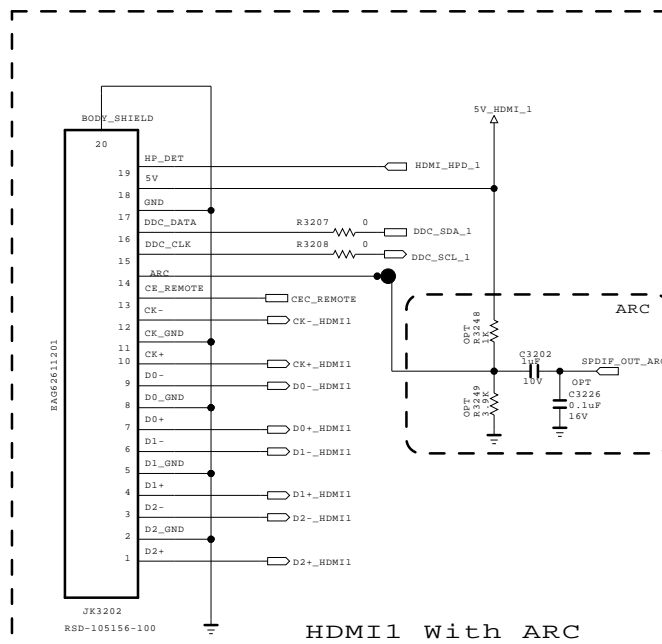
MODEL_OPT_2 \ MODEL_OPT_4	0	1
0	N/A	MC9181ABDV (TACT_KEY)
1	CM3231_CAPELLA (GP3 Soft touch)	CM3231_CAPELLA (GP4 Soft touch)

THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

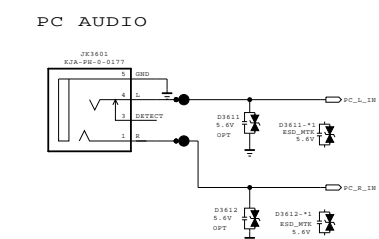
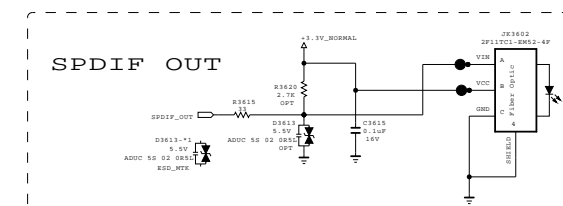
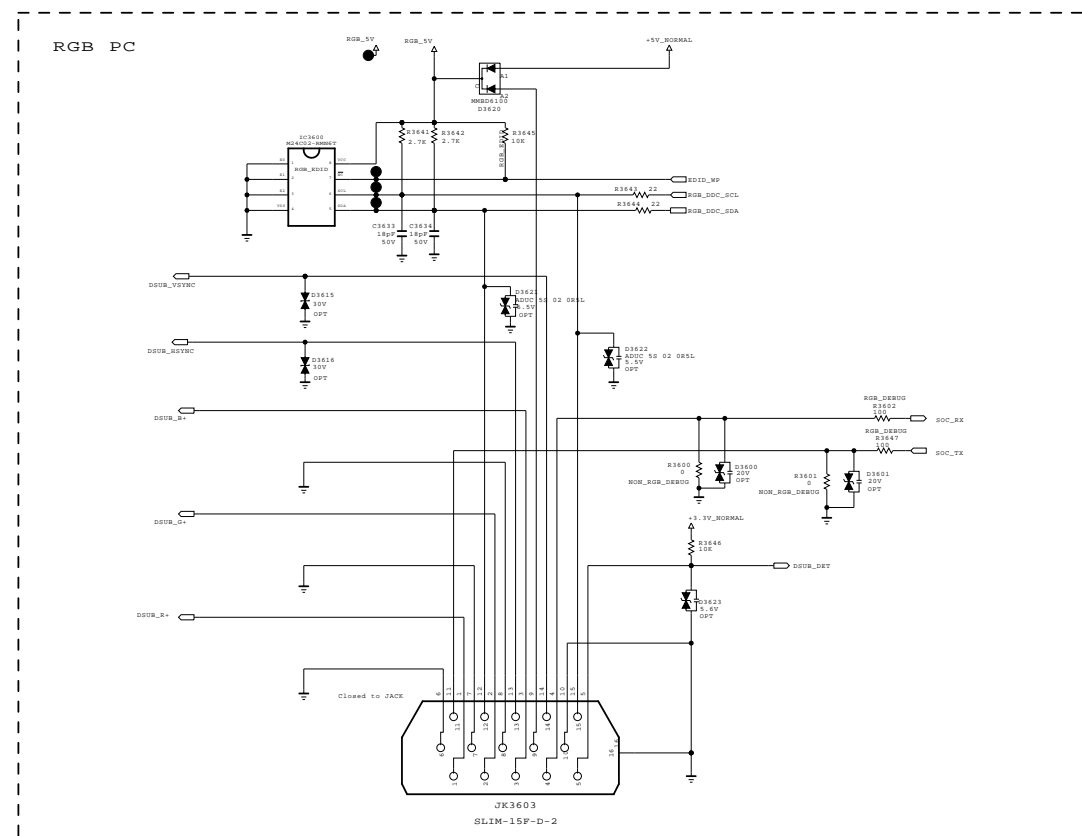
SECRET  
G Electronics





MODEL		DATE	2011.12.12
BLOCK	MICOM	SHEET	30 /



## RGB / PC AUDIO / SPDIF

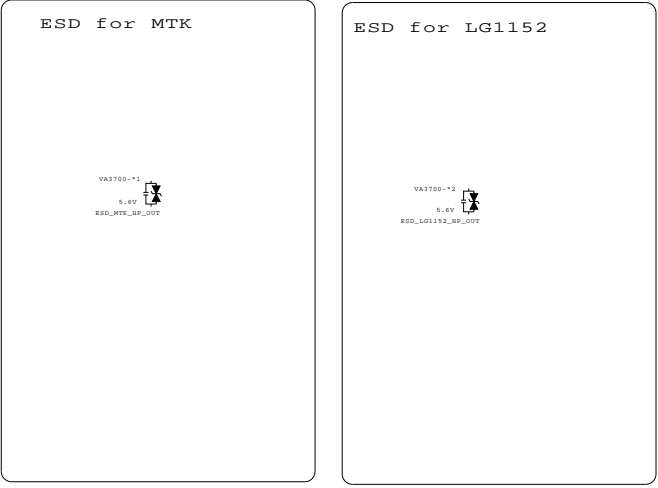


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

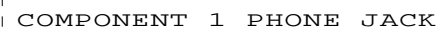
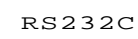
SECRET  
LGElectronics



MODEL	JACK HIGH / MID	DATE	2011.11.21
BLOCK		SHEET	36 /



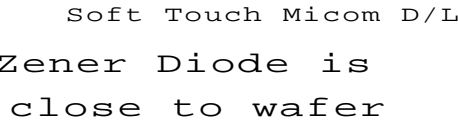
MODEL	JACK_COMMON	DATE	2011.11.21
BLOCK		SHEET	37 /





SECRET  
LGElectronics



MODEL
BLOCK







 D4104-\*1  
 5.6V 200pF  
 ADMC 5M 02 2  
 ESD\_MTK

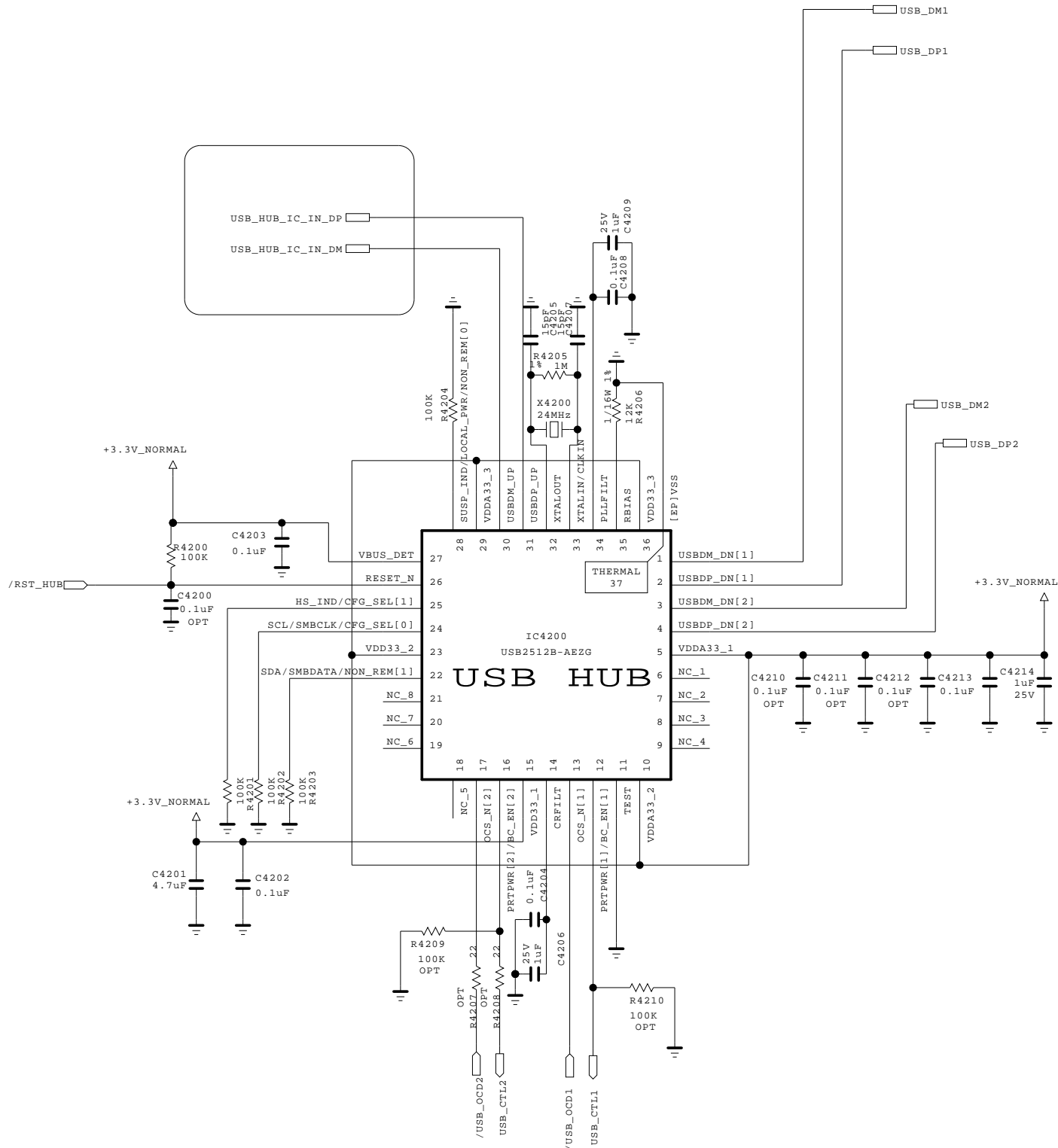

 D4104-\*2  
 5.6V 200pF  
 ADMC 5M 02 :  
 ESD\_LG1152

SECRET  
G Electronics

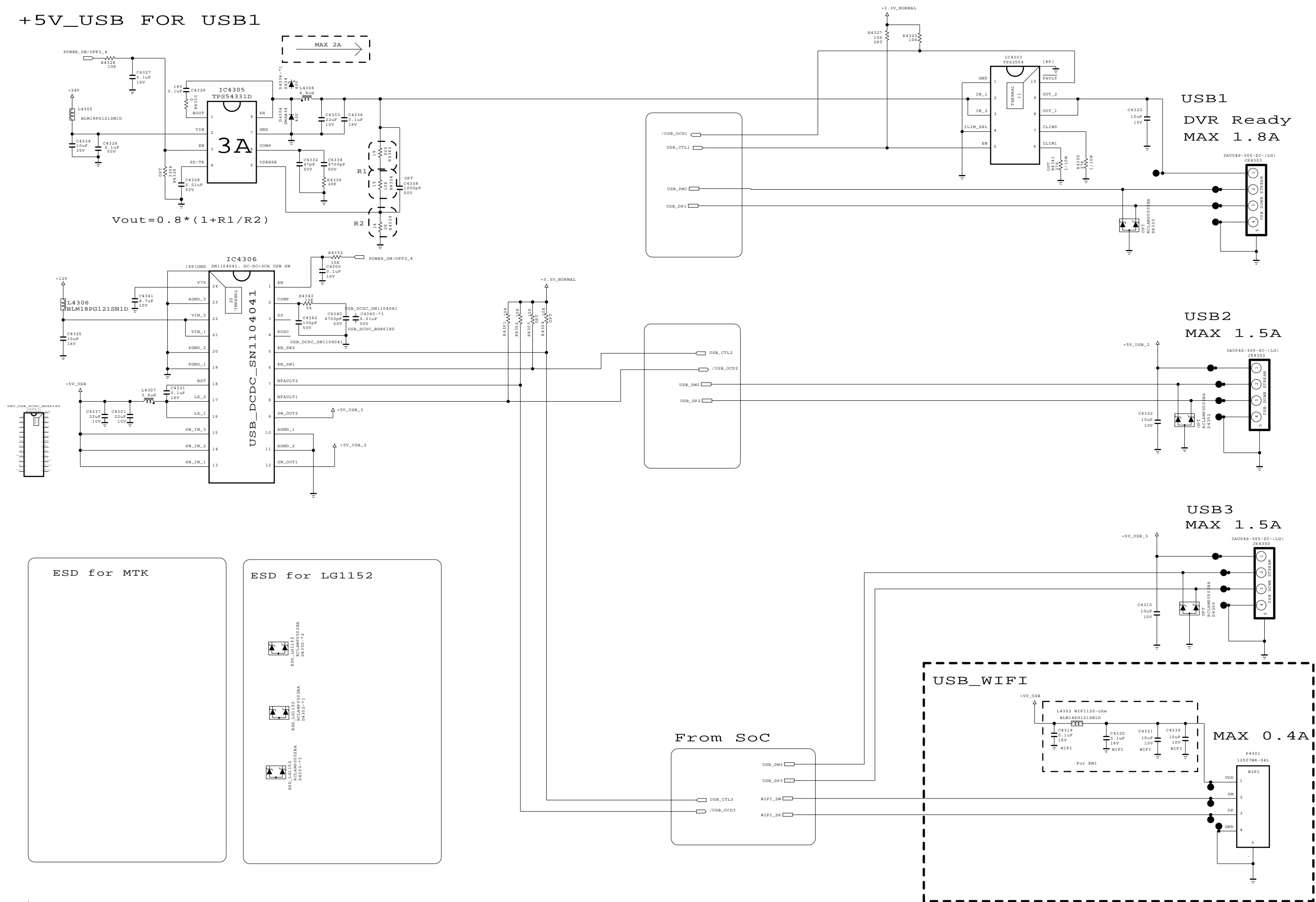


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET		 LG ELECTRONICS	MODEL	USB3_HUB	DATE	2011.06.13
LGElectronics			BLOCK		SHEET	42 /



+5V\_USB FOR USB1

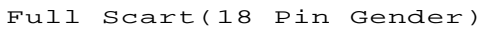


THE ⚠ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMATIC.

SECRET  
G Electronics



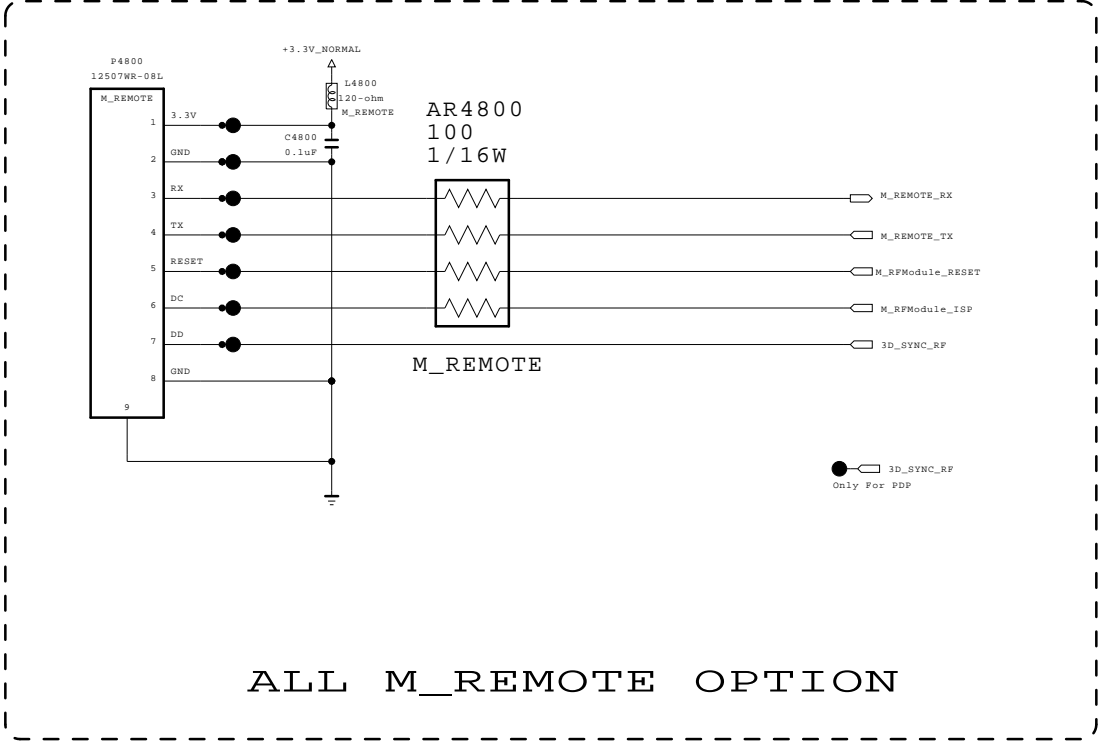
MODEL	USB3_HUB_Wifi	DATE	2011.10.26
BLOCK		SHEET	43 /





SECRET  
LGElectronics



ZigBee\_Radio Pulse M\_REMOTE OPTION



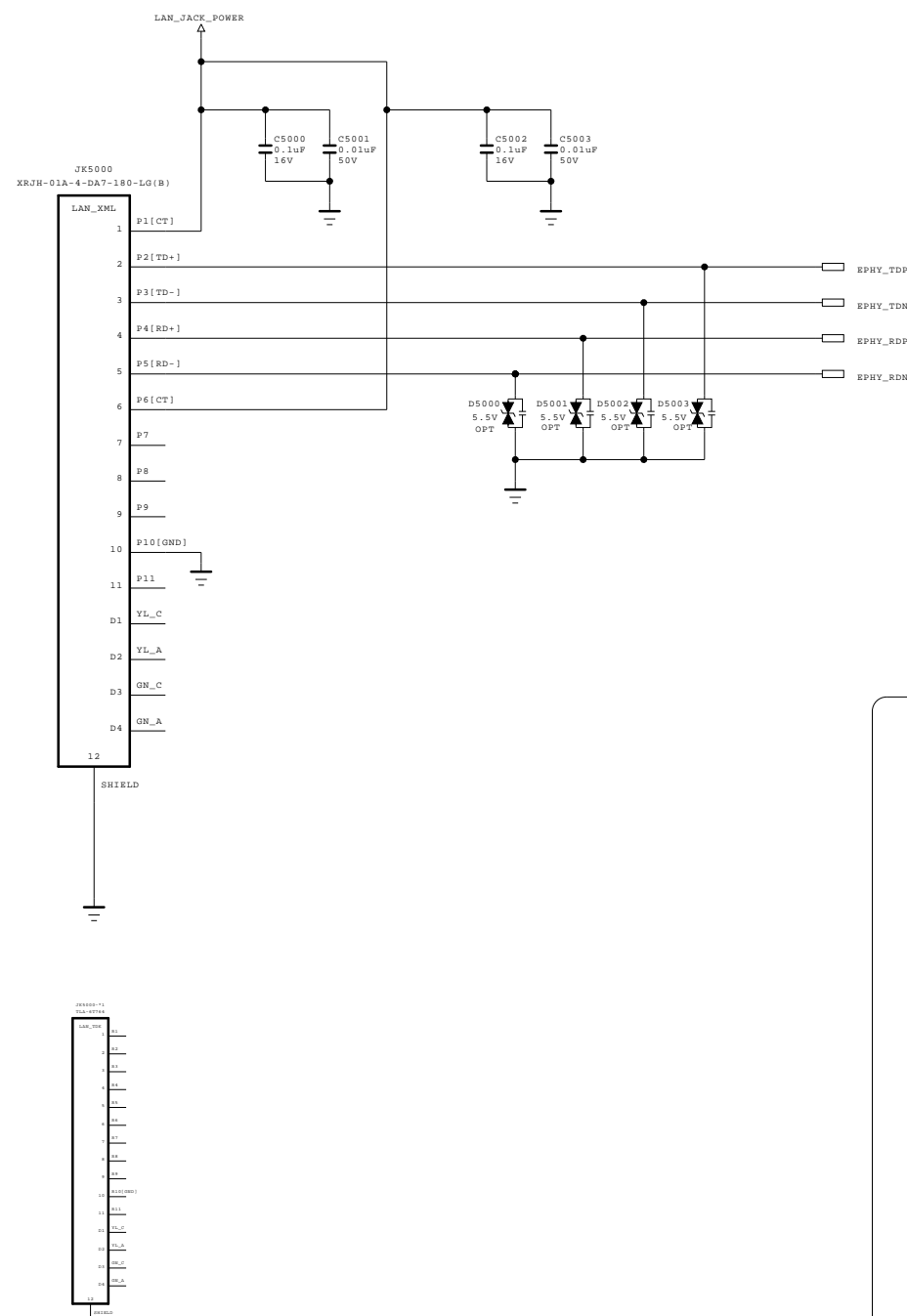
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics



MODEL	MOTION REMOTE	DATE	2011.11.21
BLOCK		SHEET	48 /

# Ethernet Block



## ESD for MTK

D5000-\*1  
ESD\_MTK  
ADUC 58 02 0R5L

D5001-\*1  
ESD\_MTK  
ADUC 58 02 0R5L

D5002-\*1  
ESD\_MTK  
ADUC 58 02 0R5L

D5003-\*1  
ESD\_MTK  
ADUC 58 02 0R5L



## ESD for LG1152

ESD\_LG1152  
D5000-\*2  
5.5V  
ADUC 58 02 0R5L

ESD\_LG1152  
D5001-\*2  
5.5V  
ADUC 58 02 0R5L

ESD\_LG1152  
D5002-\*2  
5.5V  
ADUC 58 02 0R5L

ESD\_LG1152  
D5003-\*2  
5.5V  
ADUC 58 02 0R5L

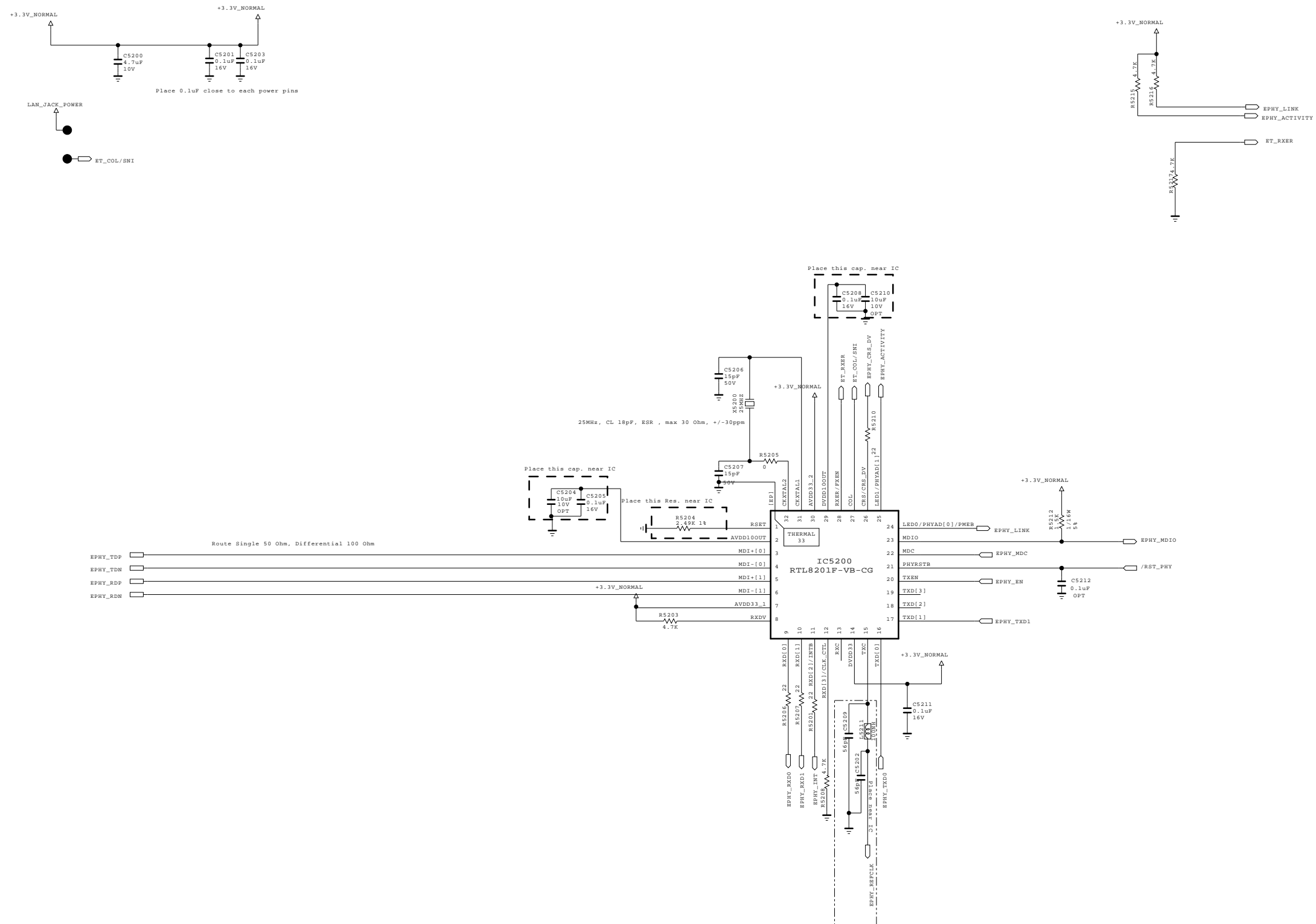
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



SECRET  
LGElectronics

 LG ELECTRONICS

MODEL	LAN_VERTICAL	DATE	2011.12.09
BLOCK		SHEET	50 /

# Ethernet Block

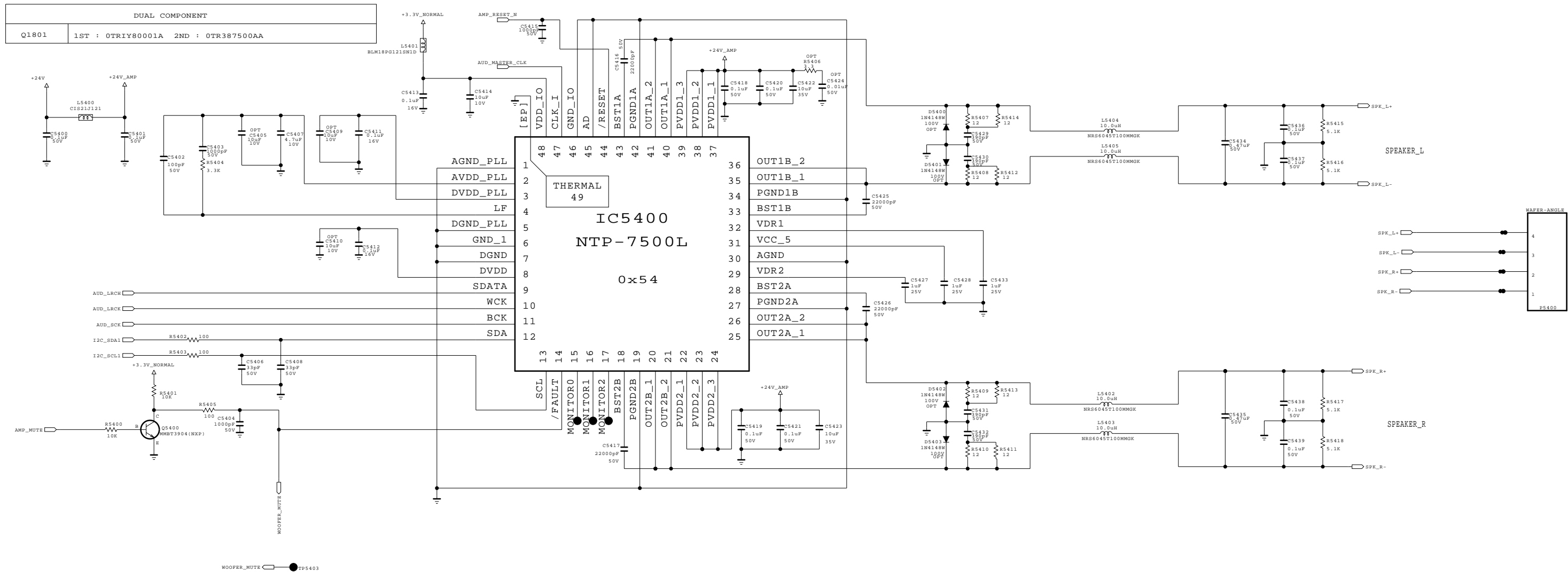




THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics



MODEL	LG1152 A0	DATE	
PORT	ETHERNET	SHEET	14 / 50

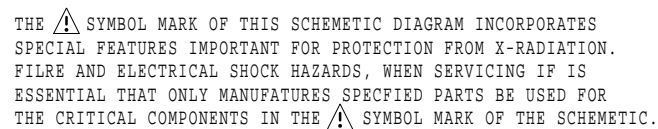


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

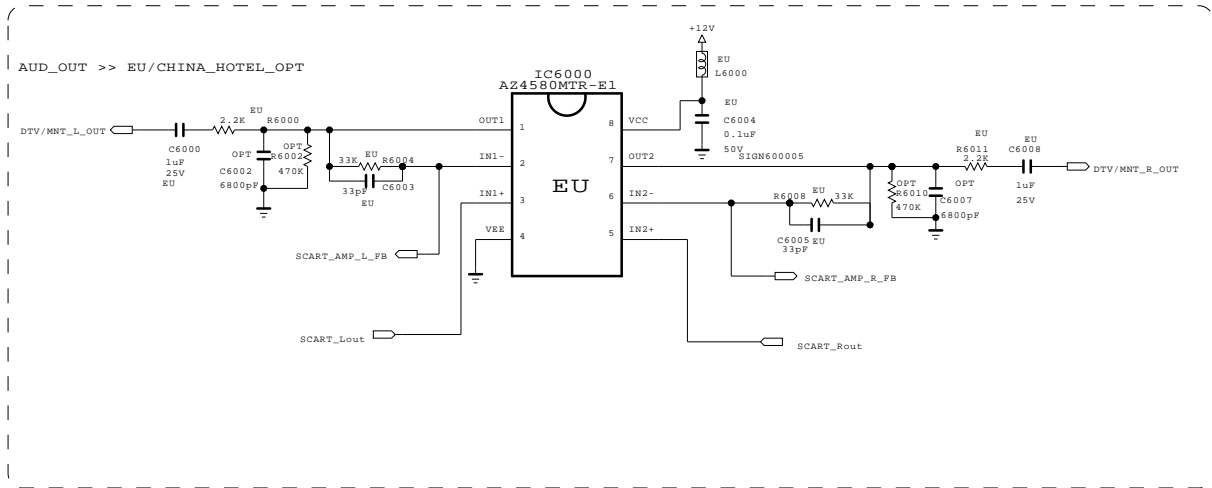
SECRET  
LGElectronics



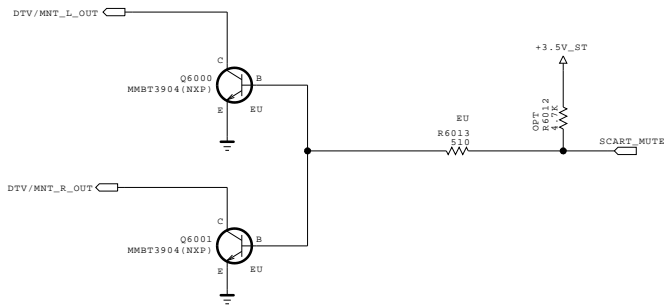
MODEL	AMP_NEO	DATE	2011.11.21
BLOCK		SHEET	54 /





MODEL		DATE	
BLOCK		SHEET	/



[ SCART AUDIO MUTE ]

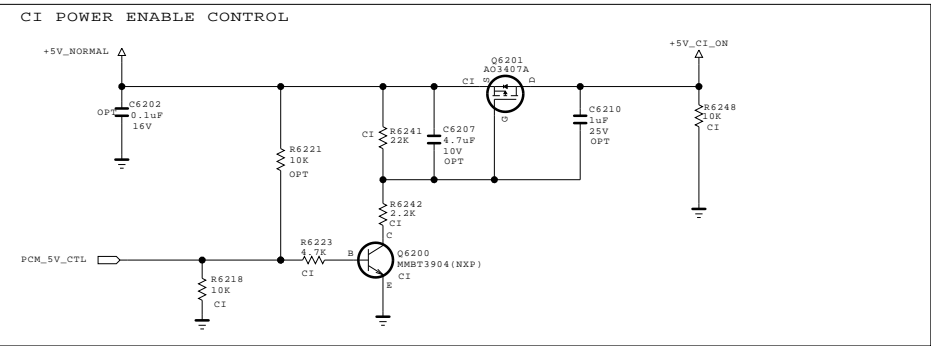


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics





MODEL	SCART AUDIO AMP	DATE	2011.11.21
BLOCK		SHEET	60 /



Option FOR MTK

C6210-\*1  
1uF  
25V  
CI\_MTK

Option FOR LG1152

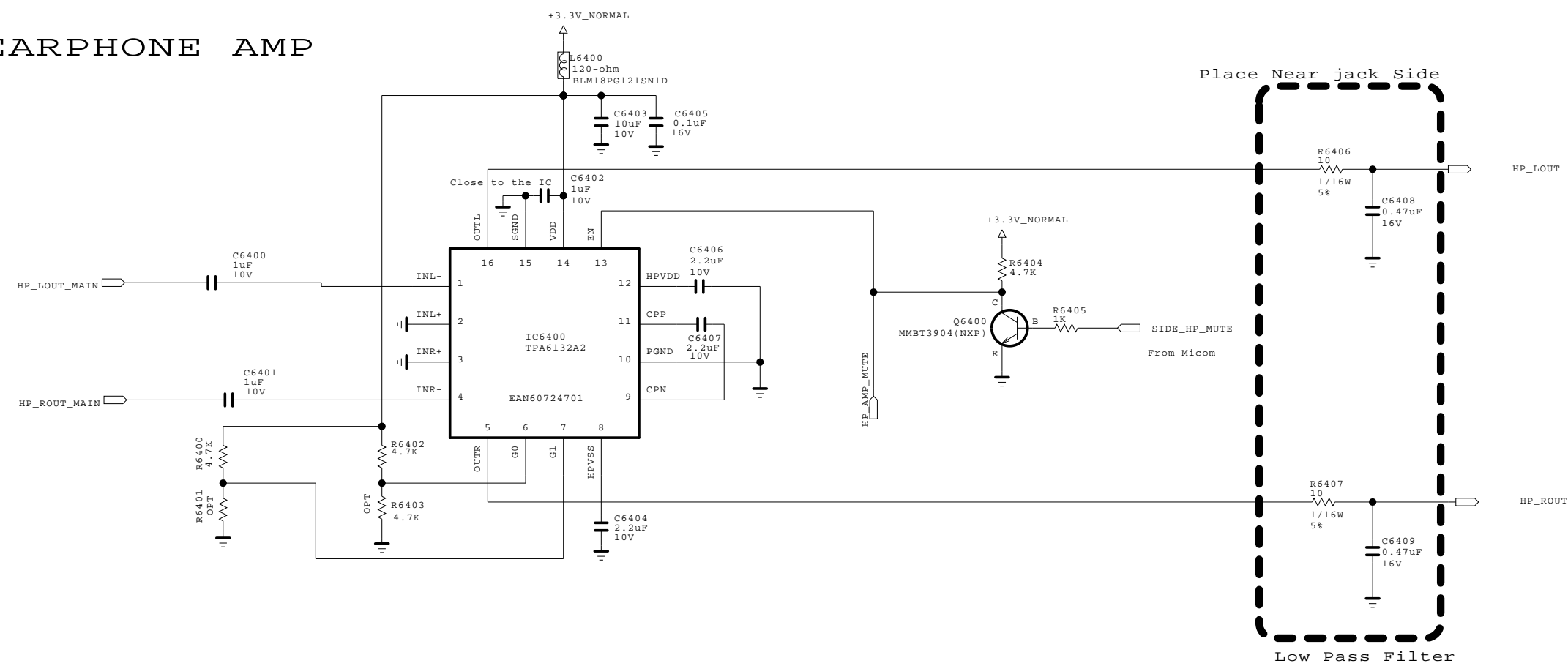
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



SECRET  
LGElectronics



MODEL	CI SLOT	DATE	2011.10.31
BLOCK		SHEET	62 /

EARPHONE AMP

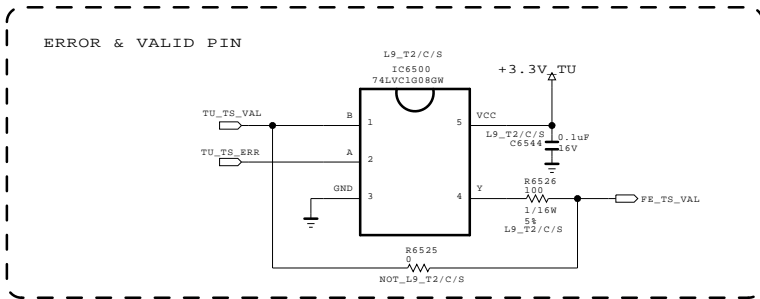
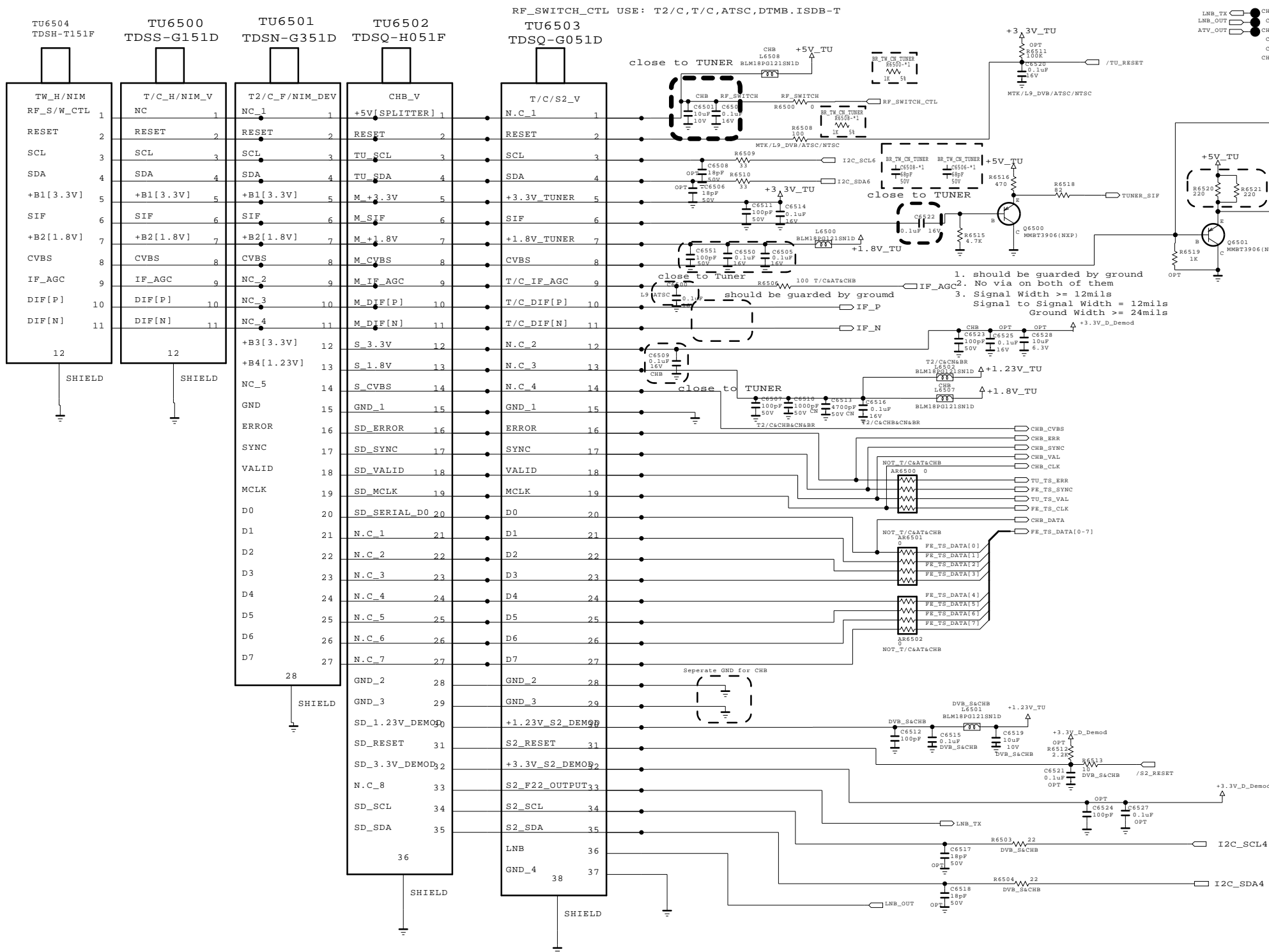


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMETIC.

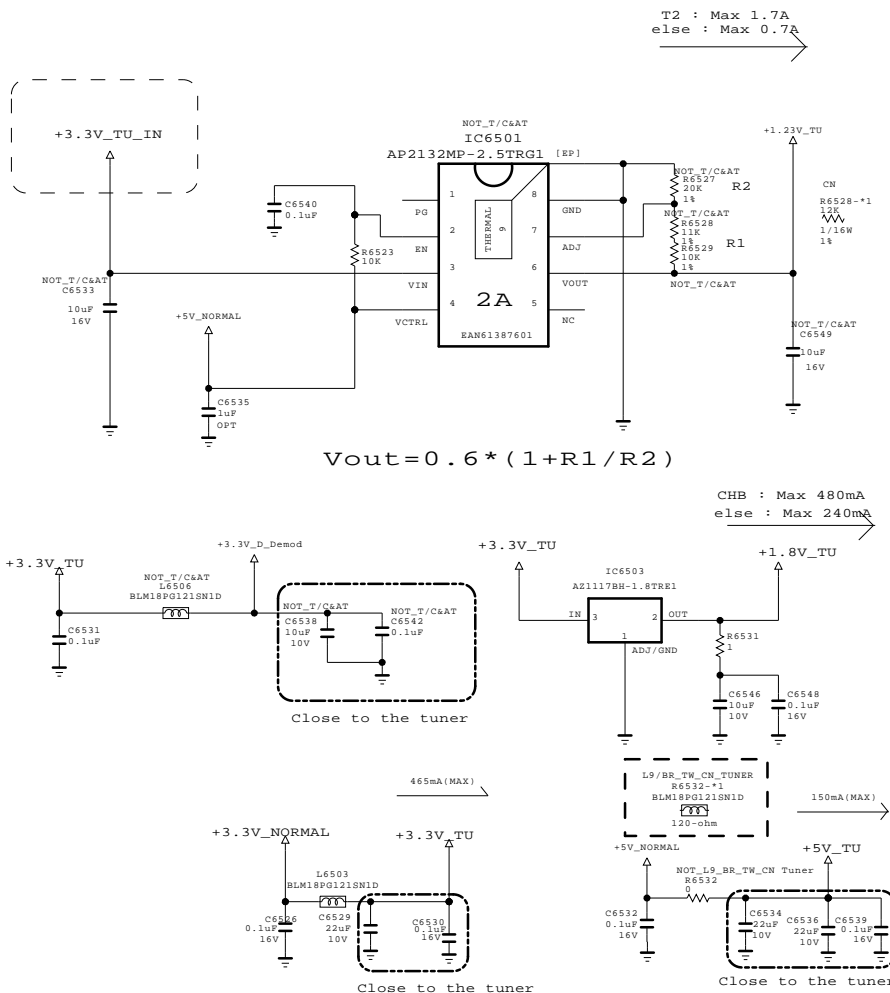
SECRET	 LG ELECTRONICS
LGElectronics	



MODEL	HEADPHONE AMP	DATE	2011.06.29
BLOCK		SHEET	61 /

## T/C/S &amp; H/NIM &amp; T2/C TUNER(EU &amp; CHINA)



T/C_H/NIM	T/C/S2	T2/C_F/NIM	T2/C/S2	CHB	AT_H/NIM	CN	BR
T/C&AT&CHB	DVB_S	NOT_T/C&AT	DVB_S	CHB	T/C&AT&CHB	CN	
NOT_DVB_S	DVB_S&CHB	T2/C	DVB_S&CHB	DVB_S&CHB	NOT_DVB_S	NOT_T/C&AT	
Not_L9_T2/C/S	NOT_T/C&AT	T2/C&CN	NOT_T/C&AT	NOT_T/C&AT	Not_L9_T2/C/S	RF_SWITCH	
	T/C&AT&CHB	T2/C&CHB&CN	T2/C	T/C&AT&CHB		NOT_T/C&AT&CHB	
	NOT_T/C&AT&CHB	NOT_T/C&AT&CHB	T2/C&CN	T2/C&CHB&CN		NOT_DVB_S	
	Not_L9_T2/C/S	NOT_DVB_S	T2/C&CHB&CN	H/NIM&CHB		Not_L9_T2/C/S	
		Not_L9_T2/C/S	NOT_T/C&AT&CHB	Not_L9_T2/C/S			
			L9_T2/C/S				



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SECRET  
LGElectronics

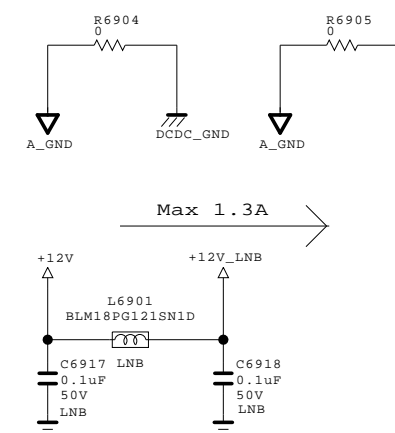


MODEL	TUNER	DATE	2011.11.21
BLOCK		SHEET	65 /

## (Option:LNB)

Input trace widths should be sized to conduct at least 3A

Ouput trace widths should be sized to conduct at least 2A

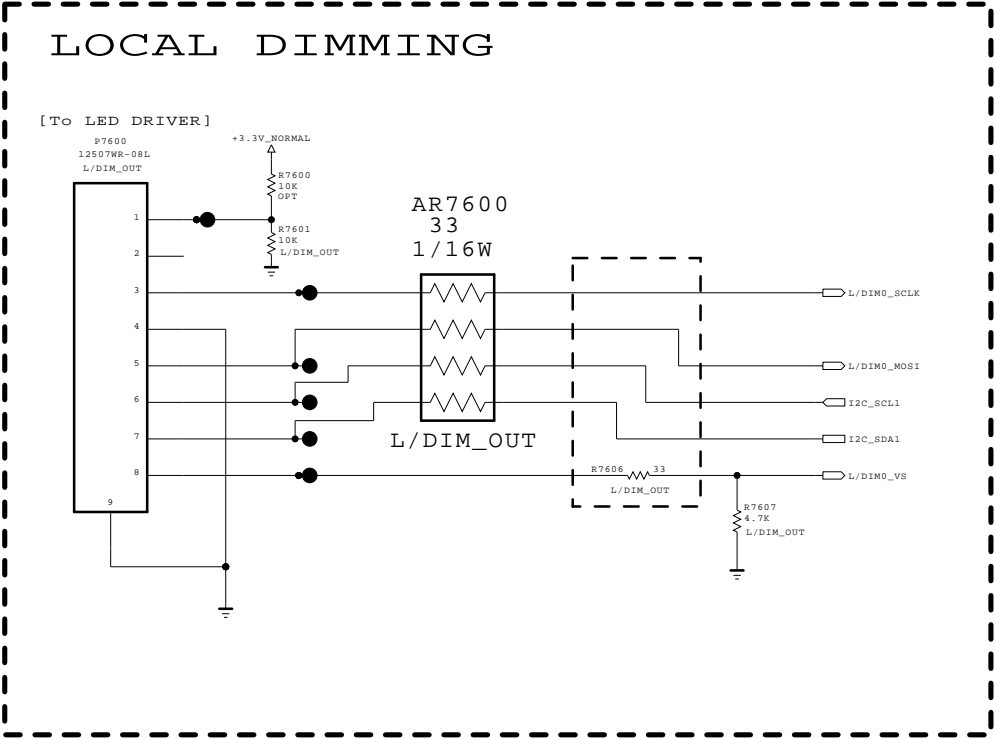




SECRET  
LGElectronics



MODEL	LNB	DATE	2011.11.21
BLOCK		SHEET	69 /





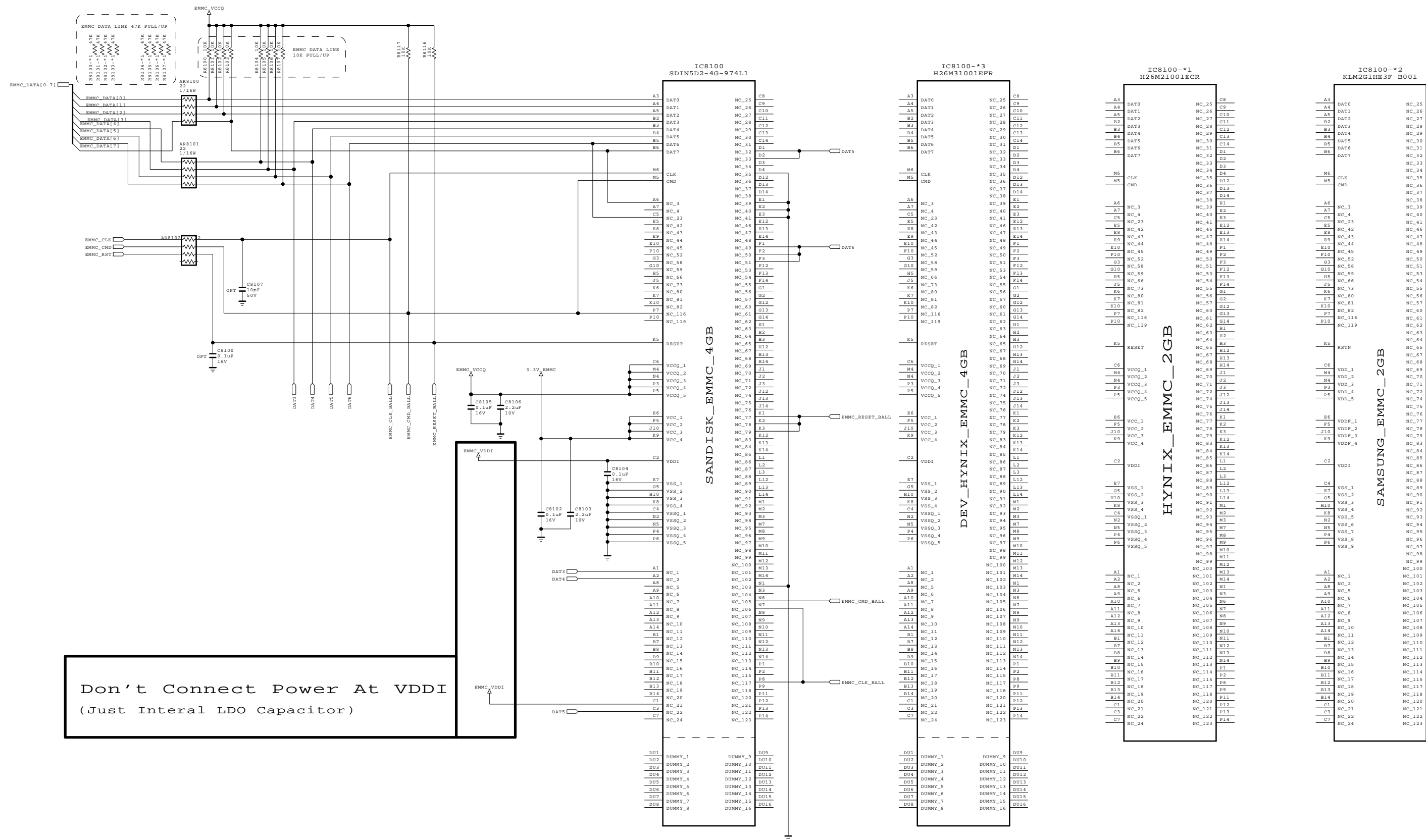
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SECRET  
LGElectronics



MODEL	LOCAL DIMMING	DATE	2011.12.13
BLOCK		SHEET	76 /

## eMMC I / F'



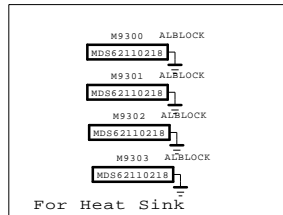
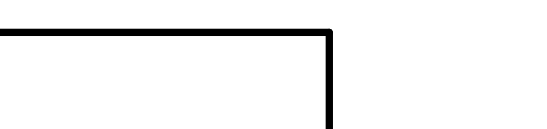
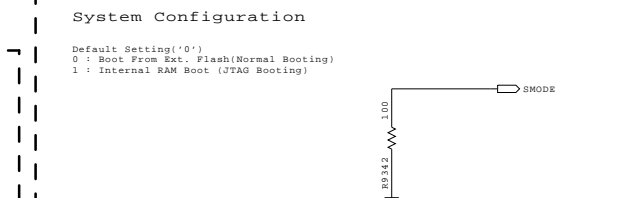
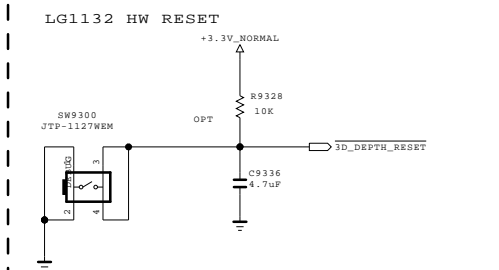
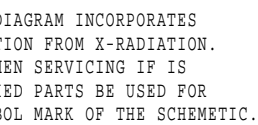
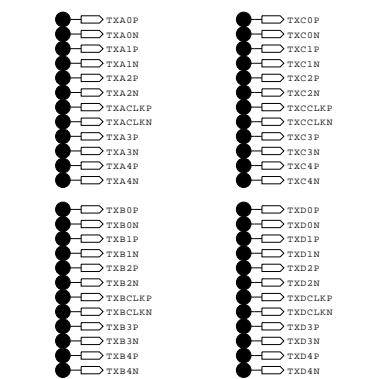
THE ⚠ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics



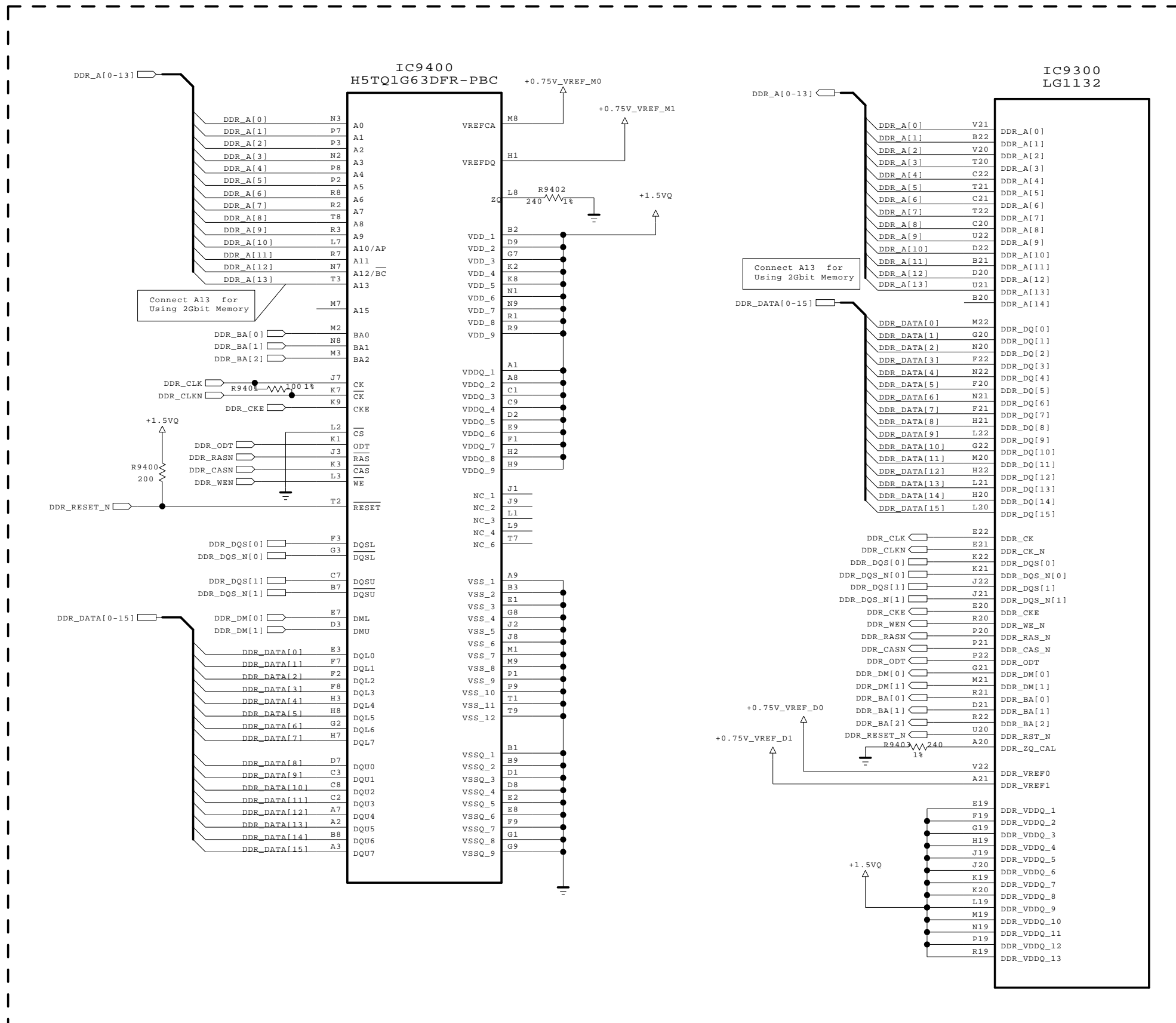
MODEL	eMMC	DATE	11.09.29
BLOCK		SHEET	81 /



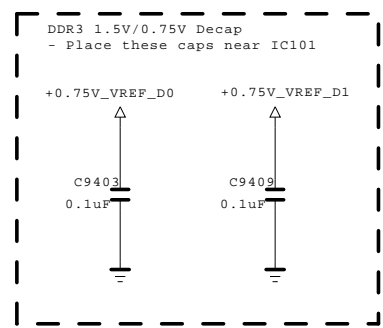
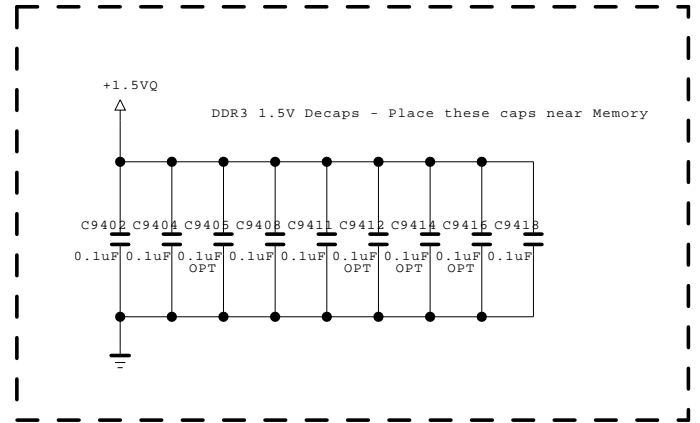
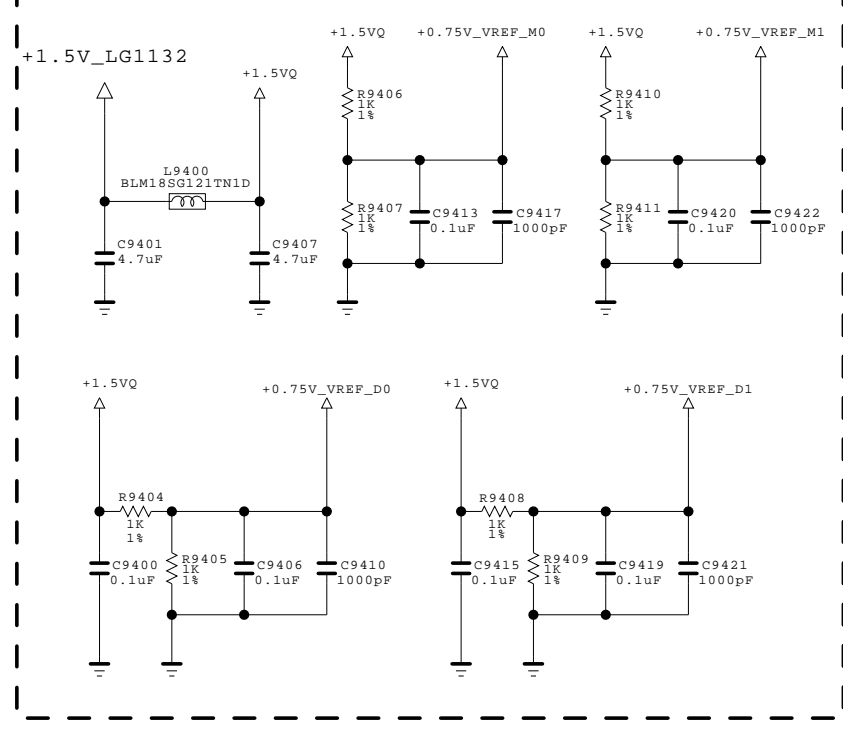


SECRET  
G Electronics


MODEL	LG1152 B0	DATE	2011. 11. 28
BLOCK	3D Depth	SHEET	/

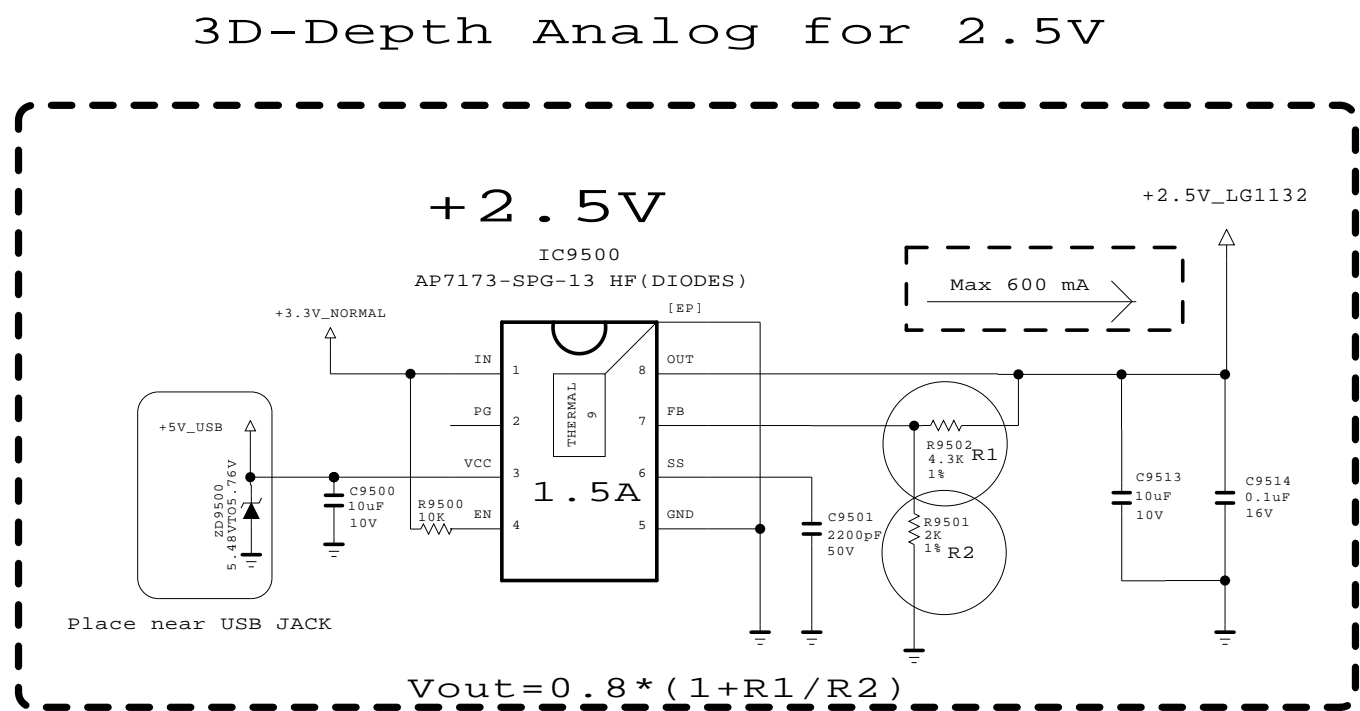
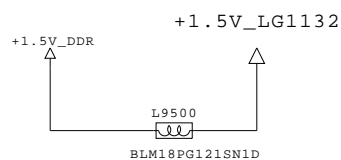


DDR0 PHY VREF

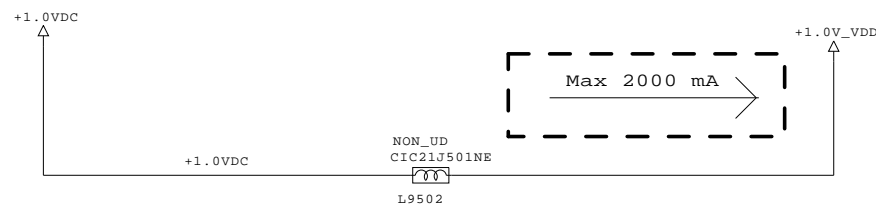


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SECRET	 LG ELECTRONICS	MODEL	LG1132 DDR3	DATE	2011. 06 .28
LGElectronics		BLOCK	LG1132 DDR3	SHEET	/



## LG1152 for 1.0V



### \*\*NON UD Model

LG1132 DDR = 668Mhz  
 LG1152 1.0V ==> IC2306  
 LG1132 1.0V ==> IC2306

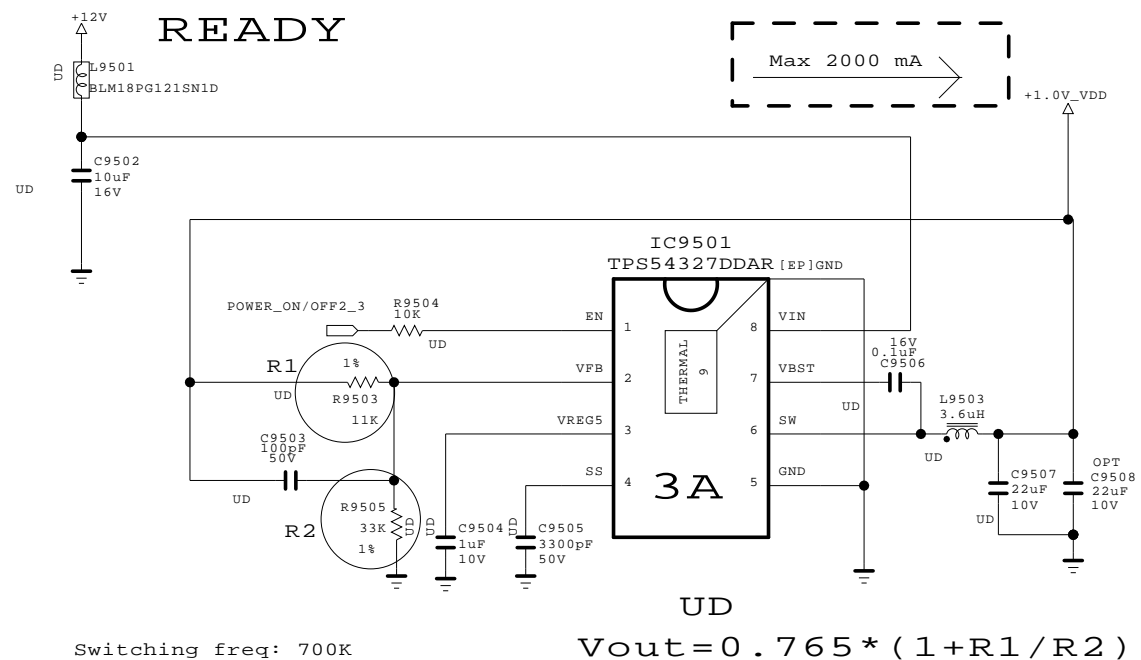
### \*\*UD Model

LG1132 DDR = 792Mhz  
 LG1152 1.0V ==> IC2501  
 LG1132 1.1V ==> IC2306

## L9 CORE for 1.0V

(UD Model only / LG1132 DDR=792Mh)

### READY



Switching freq: 700K

THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

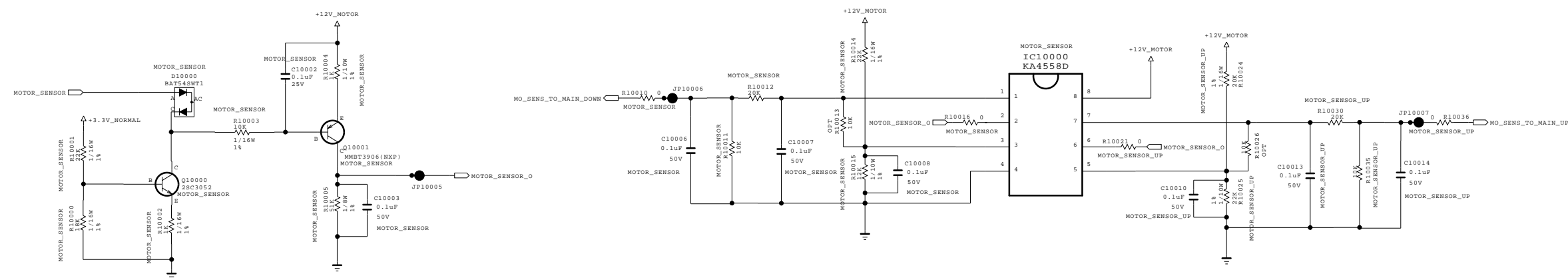
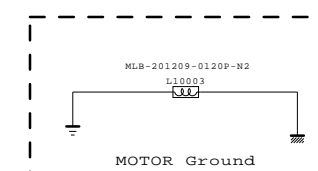
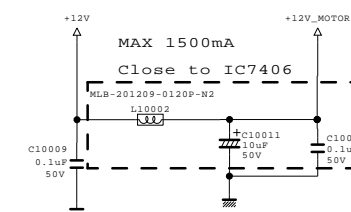
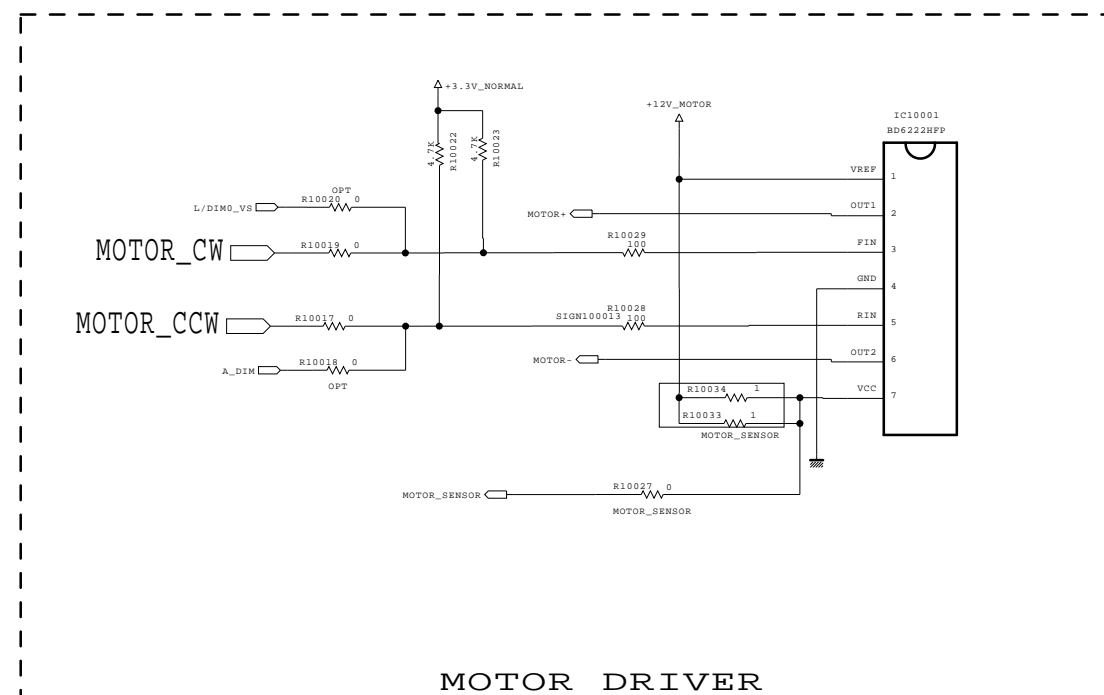
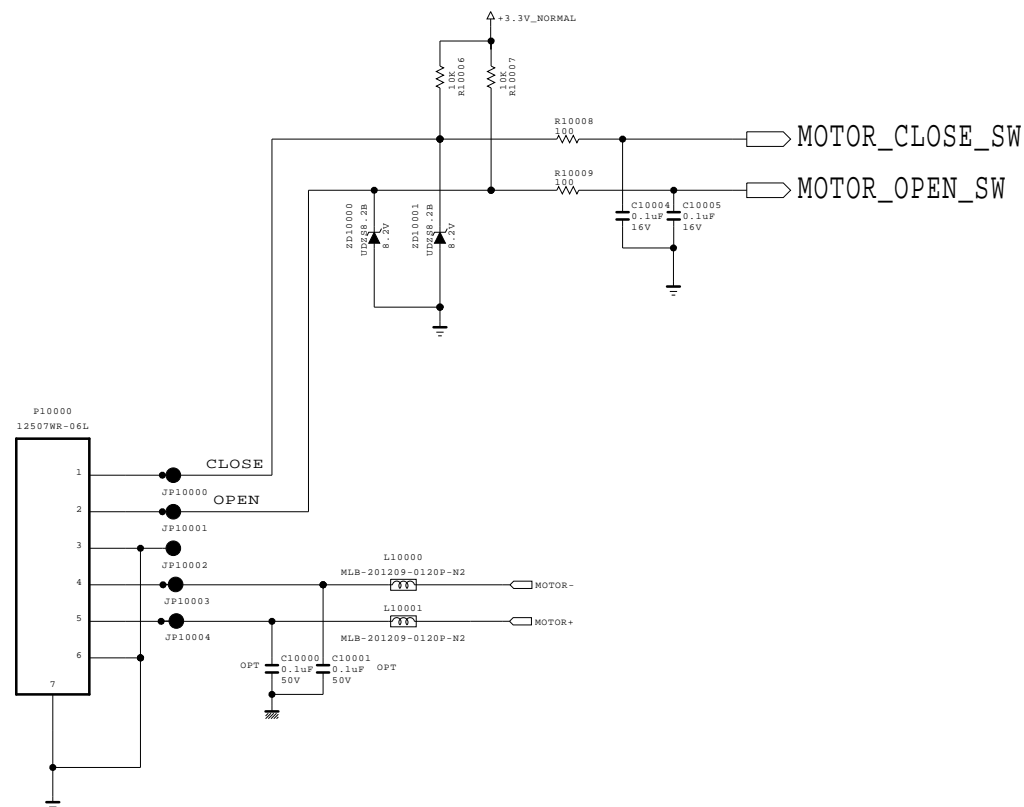
SECRET



LGElectronics



LG ELECTRONICS

MODEL	LG1132 Power	DATE	2011. 06. 28
BLOCK	LG1132 POWER	SHEET	/



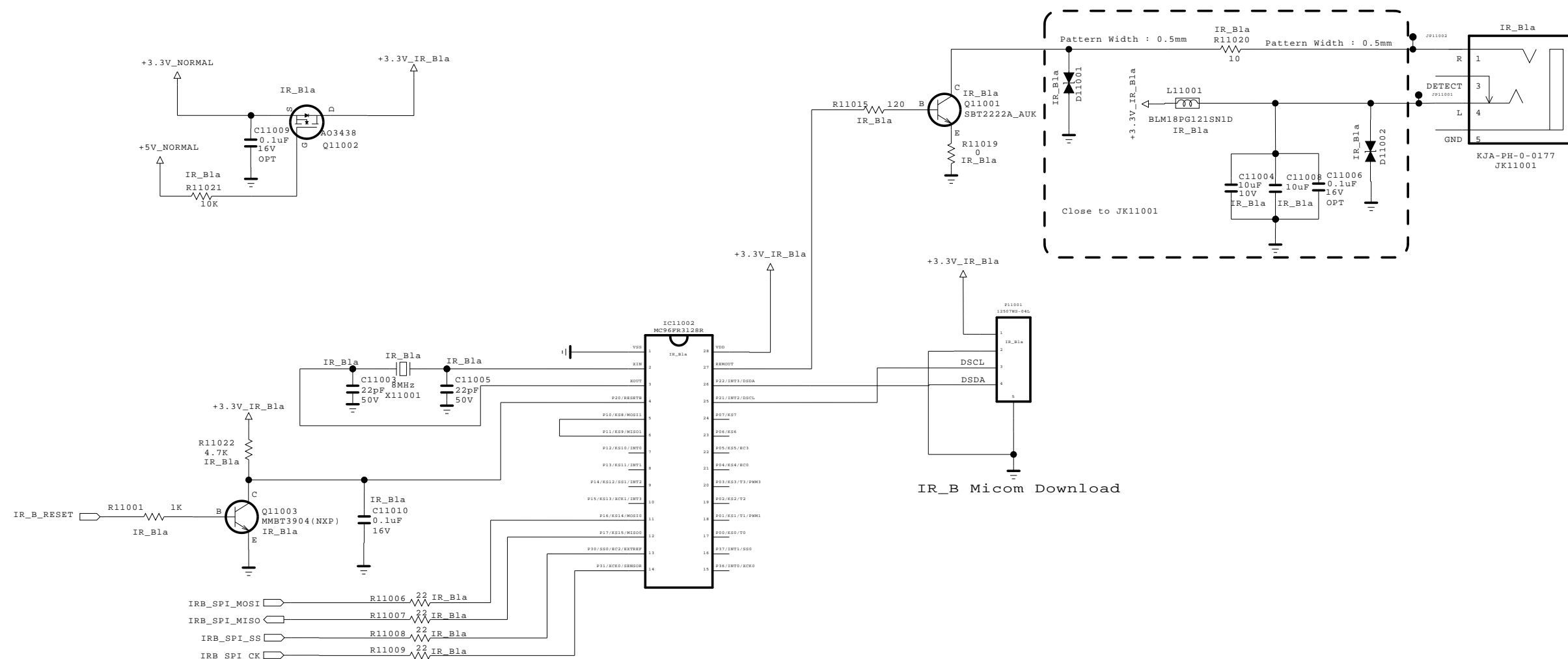
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



SECRET  
LG Electronics



MODEL	GP4	DATE	2011.07.01
BLOCK	MOTOR CONTROL	SHEET	/

## IR BLASTER



THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics



MODEL	LG1152 A1	DATE	2011. 06. 02
BLOCK	IR Blaster/Boost	SHEET	94 /



# **LCD TV Repair Guide**

**`12 years New Models**

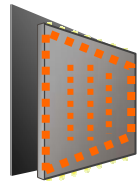
**< Applicable Model >  
XXLM9600-NA**

# **Overview for '12 Broadband Model Korea (Hardware)**

## 2 types of LED - ALEF

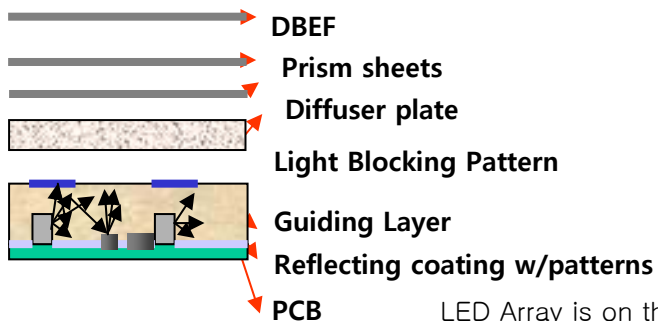


Benefit: More Clear More Real

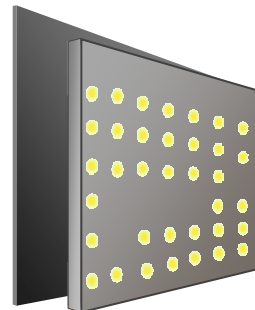


### ALEF Type Local Dimming

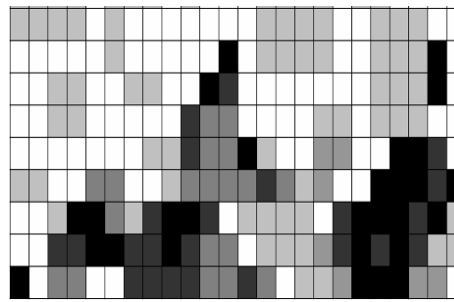
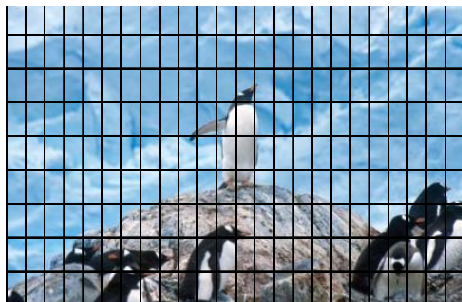
BLU  
structure



LED Array is on the back of Module



Local  
Dimming



### Feature

**ALEF LED**

Best picture quality + thin TV  
Slimmer depth  
better picture quality

**Local  
Dimming**

Local dimming depicts more  
deep black.

### Model

**XXLM9600**

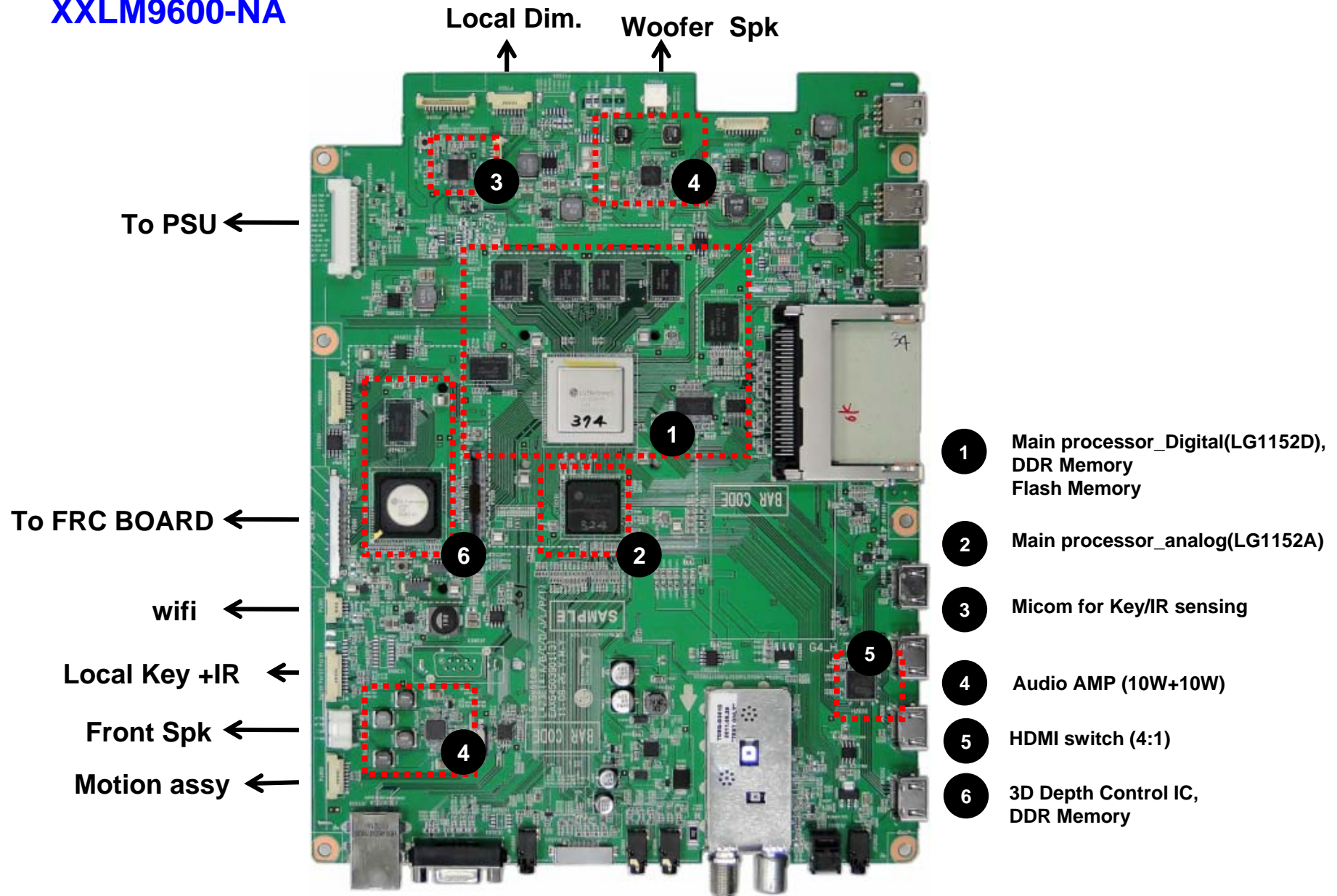
**47inch : H(6) \* V(4) = 24Block**

**55inch : H(6) \* V(4) = 24Block**

# Main PCB for Broadband

Main + TCON all in one

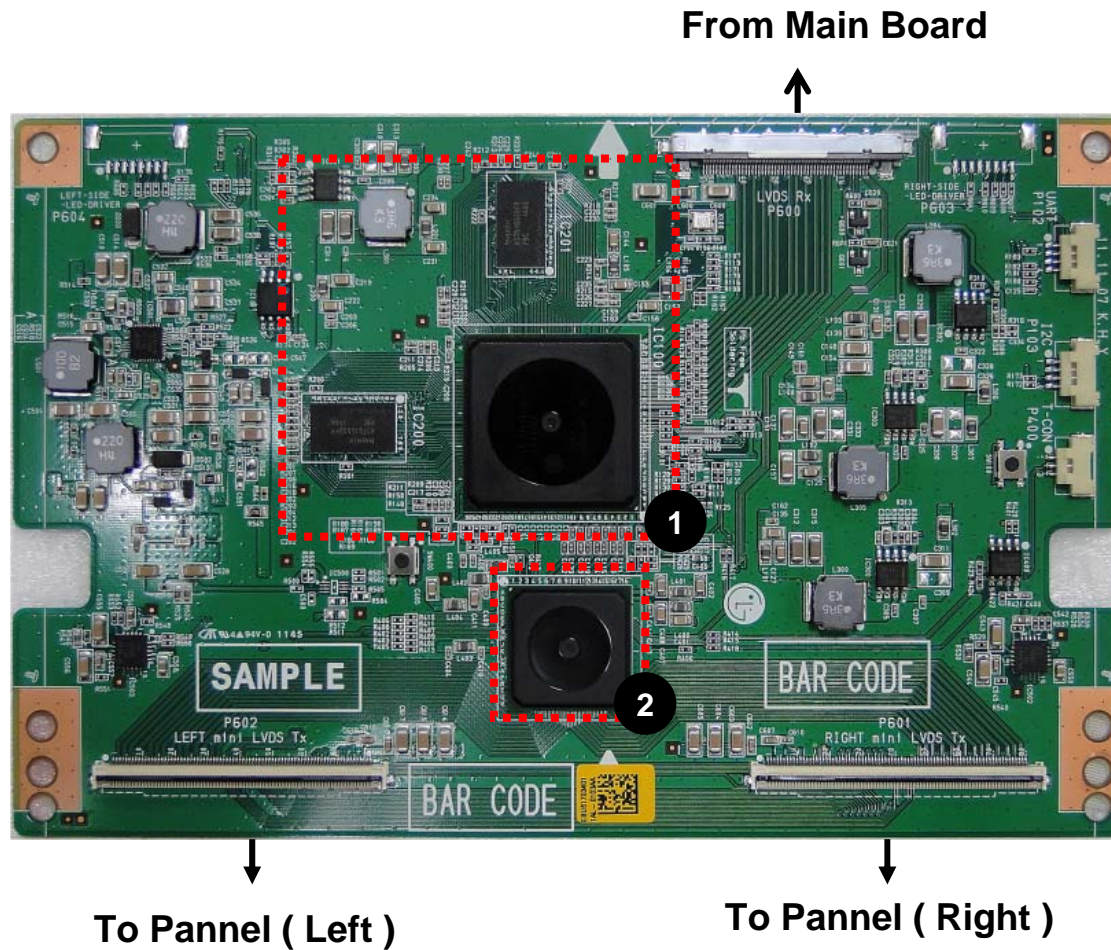
XXLM9600-NA



# FRC Board for Broadband

Main + TCON all in one

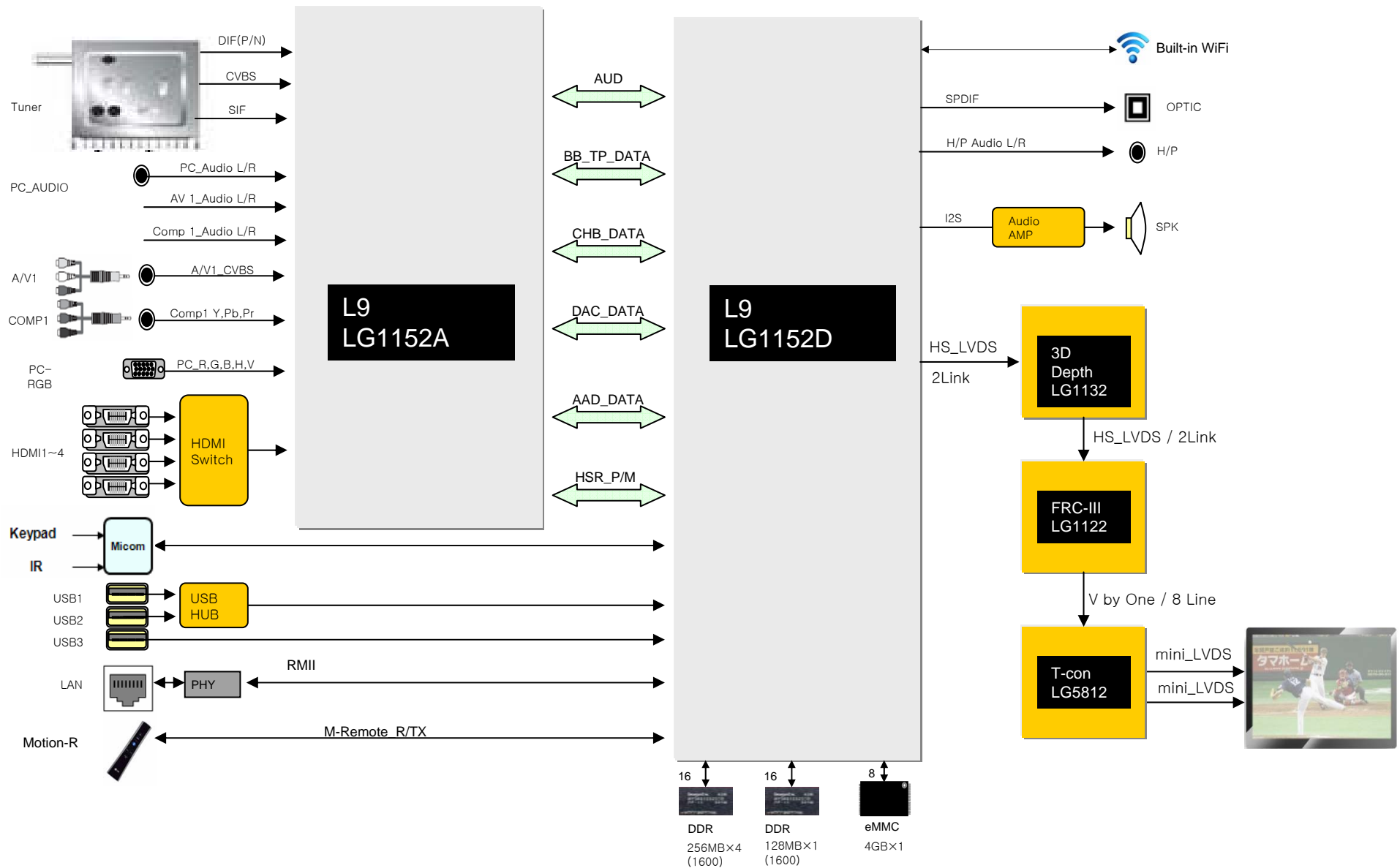
XXLM9600-NA



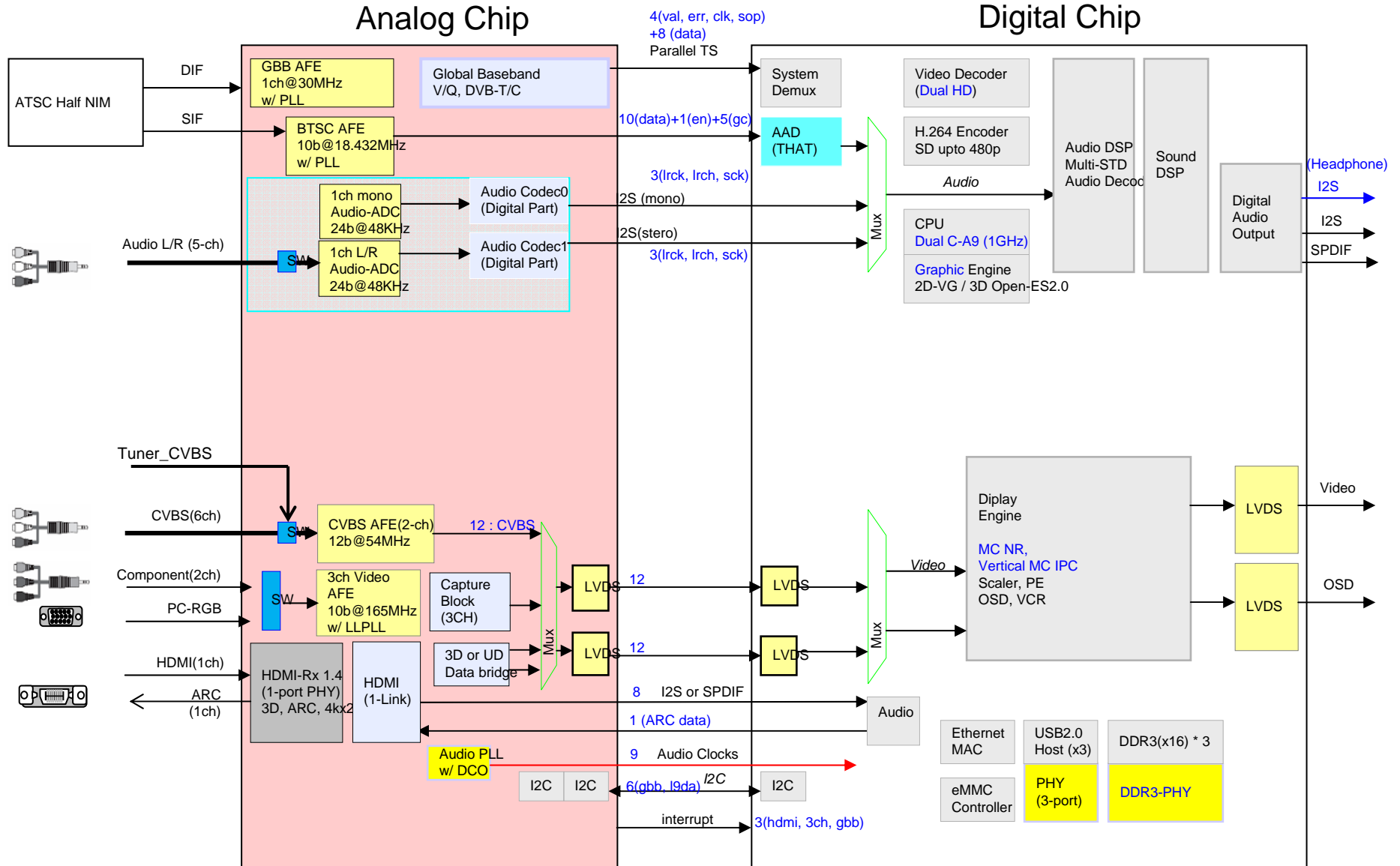
1 FRC Processor(LG1122)

2 T-Con IC(LG5812)

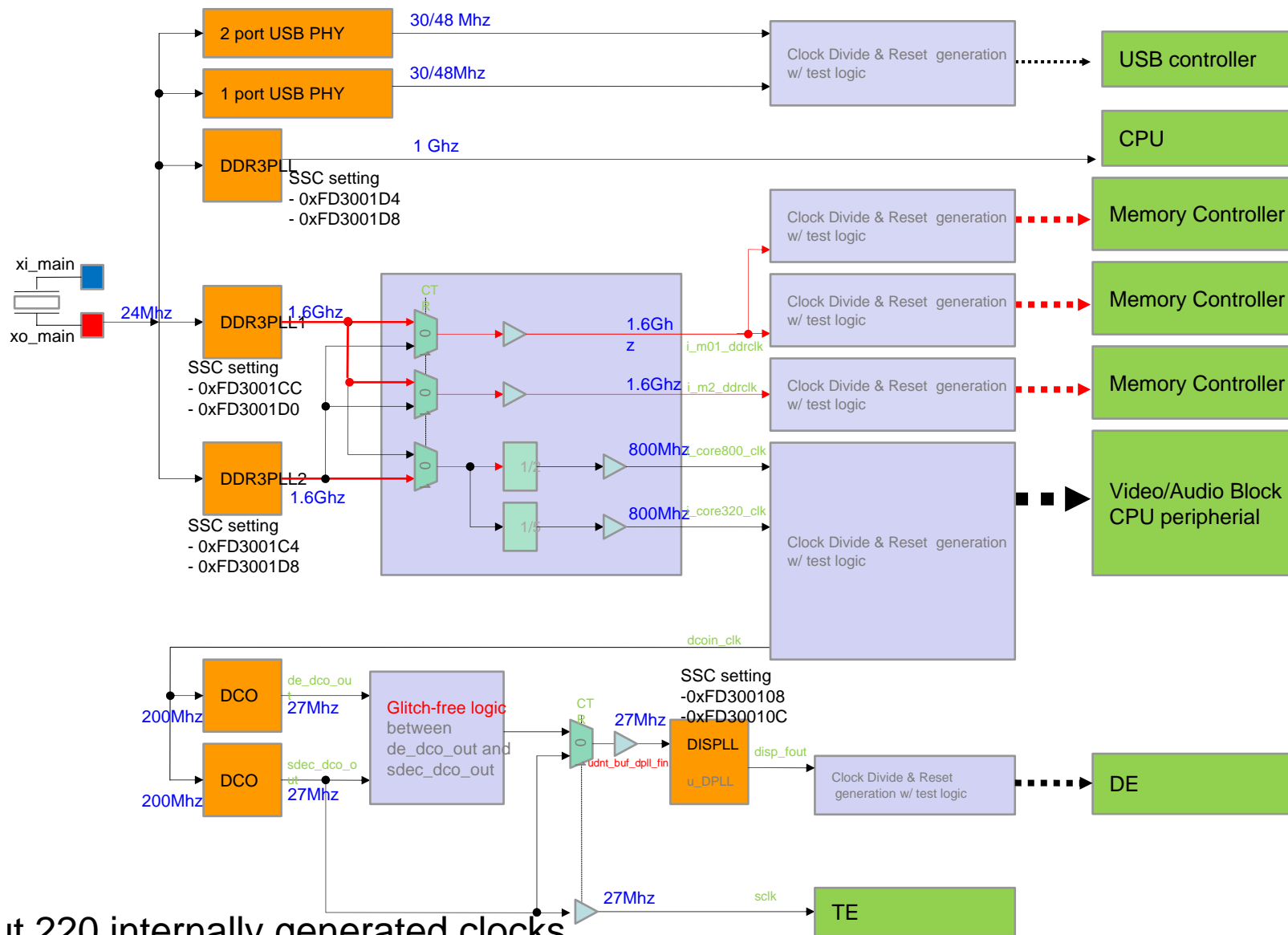
# L9 Block diagram



# L9 Block diagram

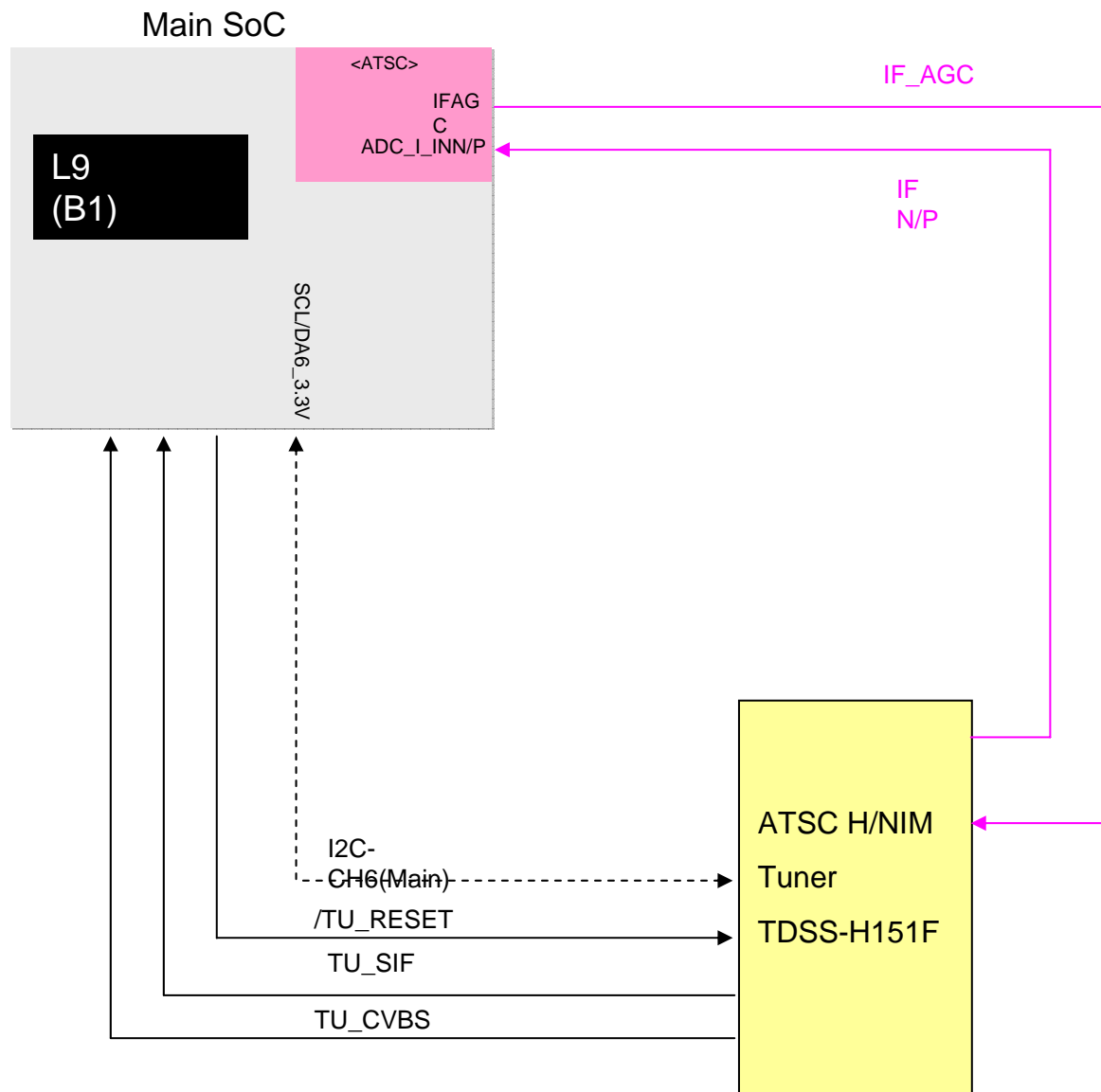


# L9 Block diagram

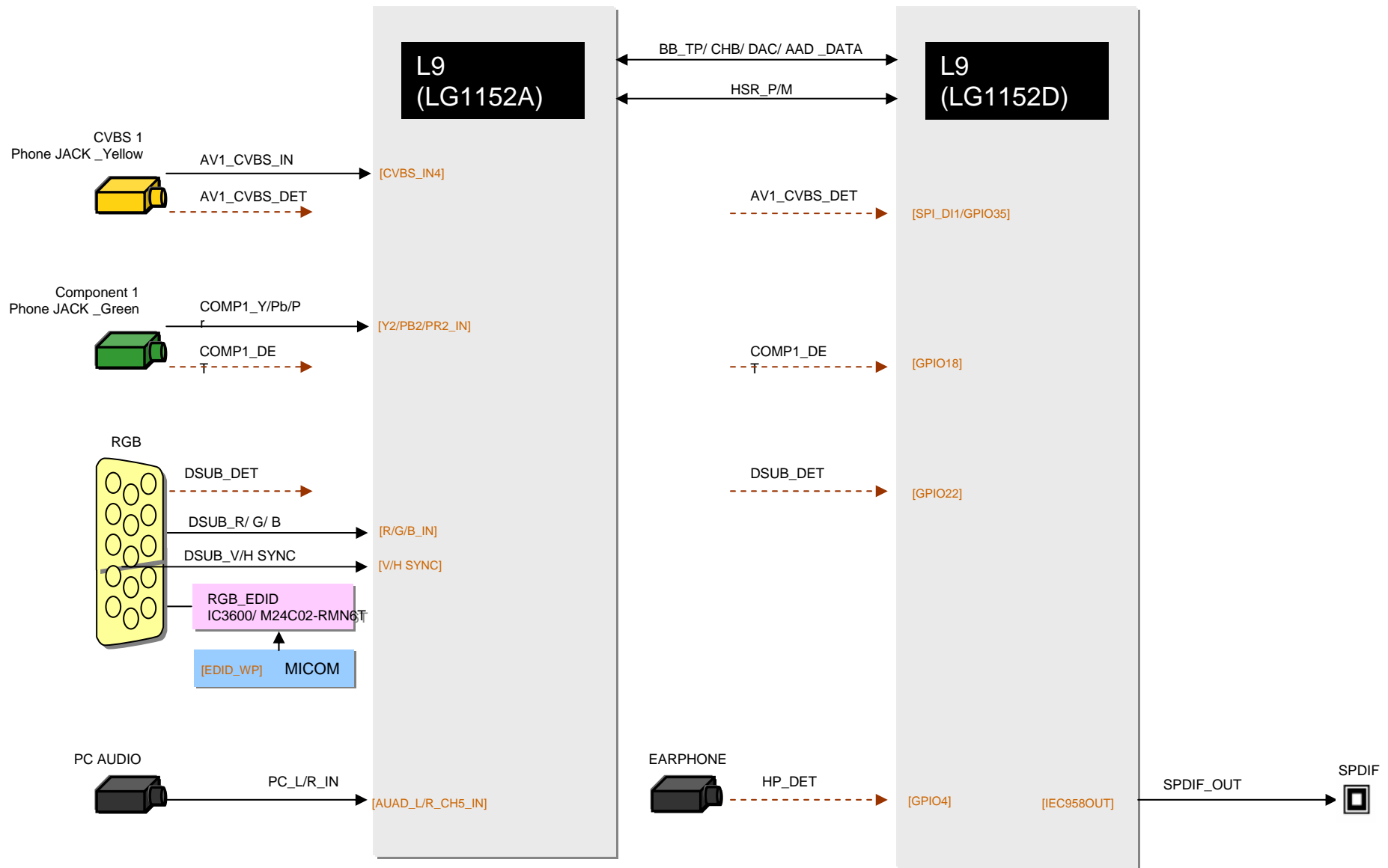


About 220 internally generated clocks

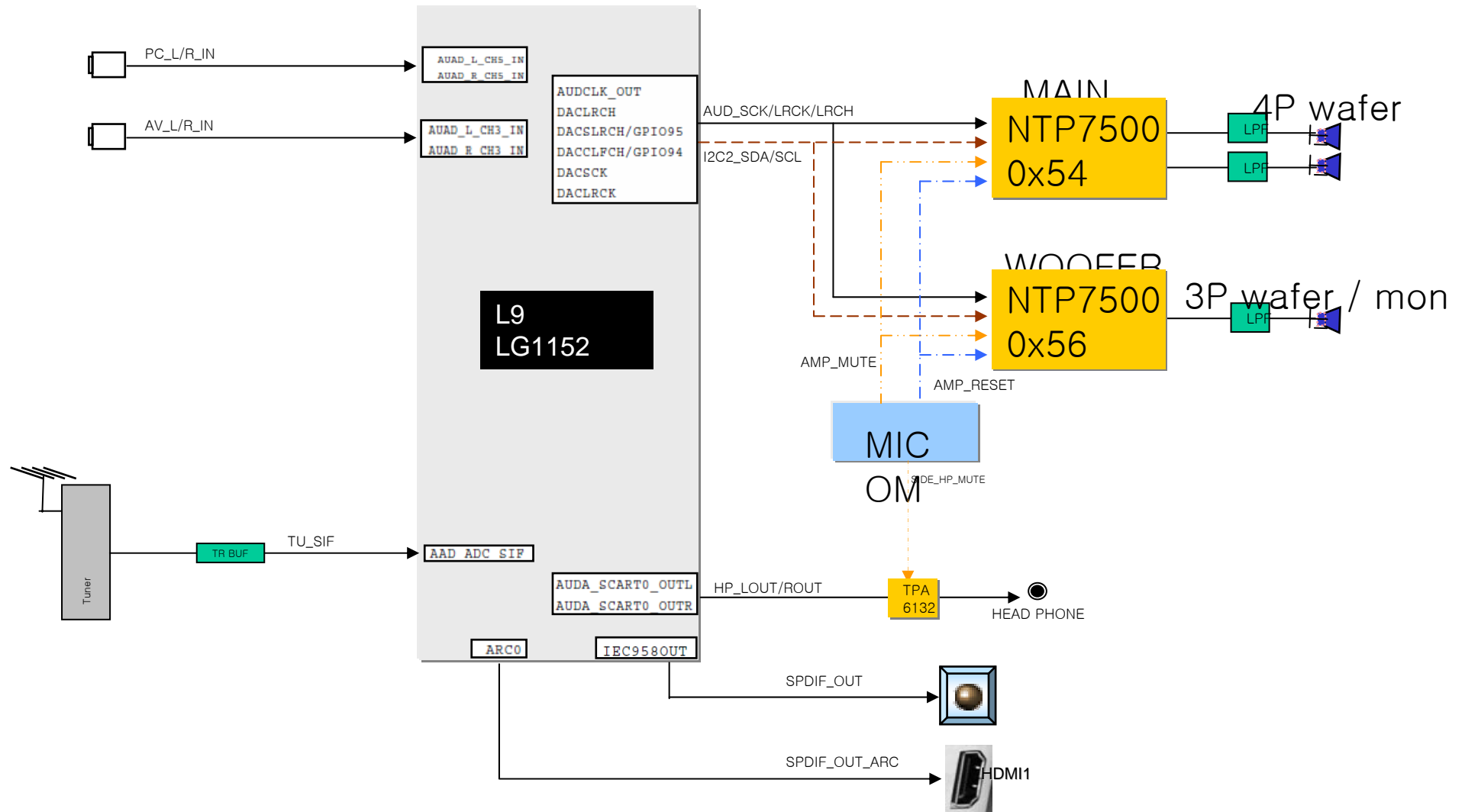
# L9 Block diagram



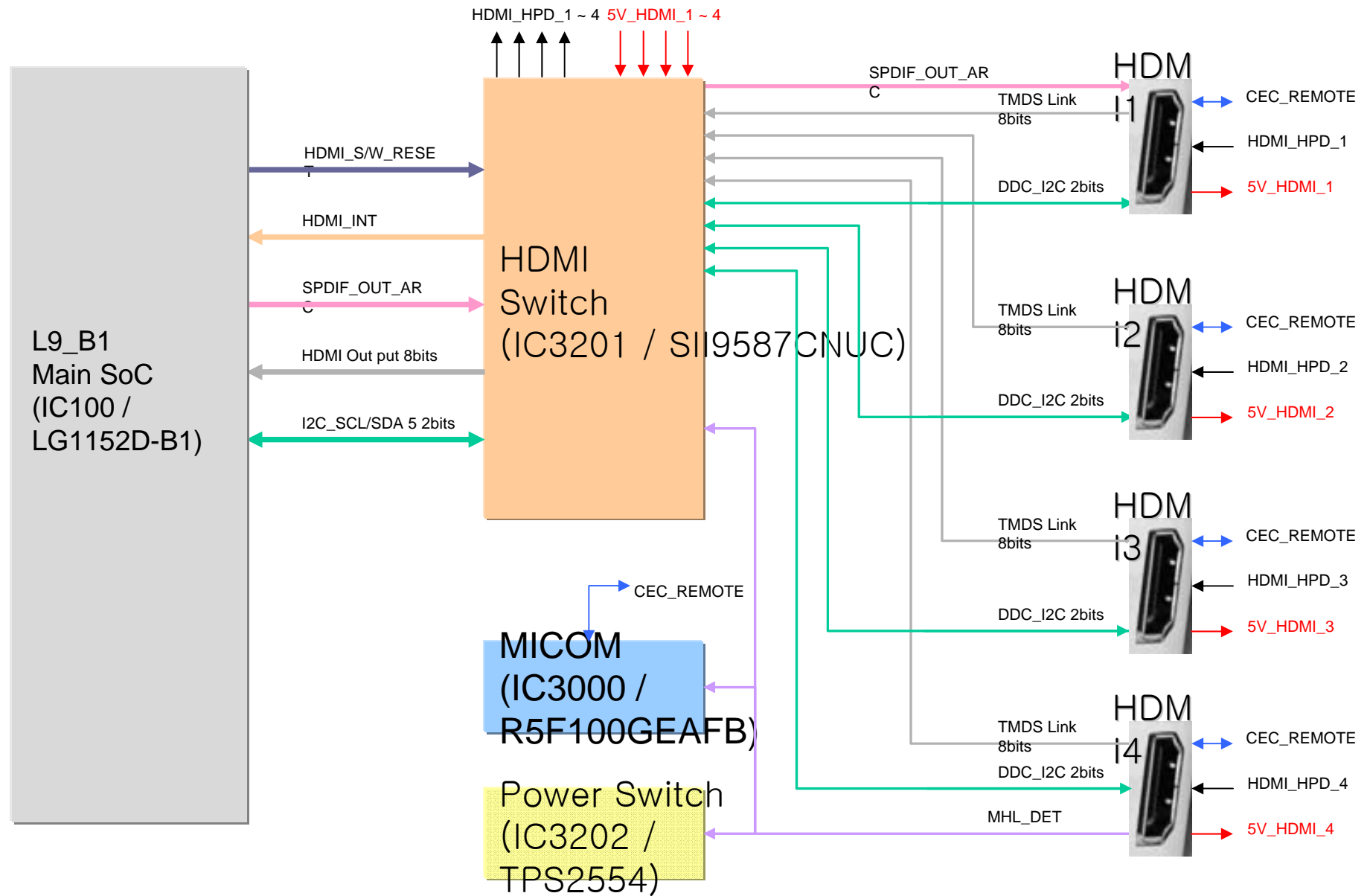
# L9 Block diagram



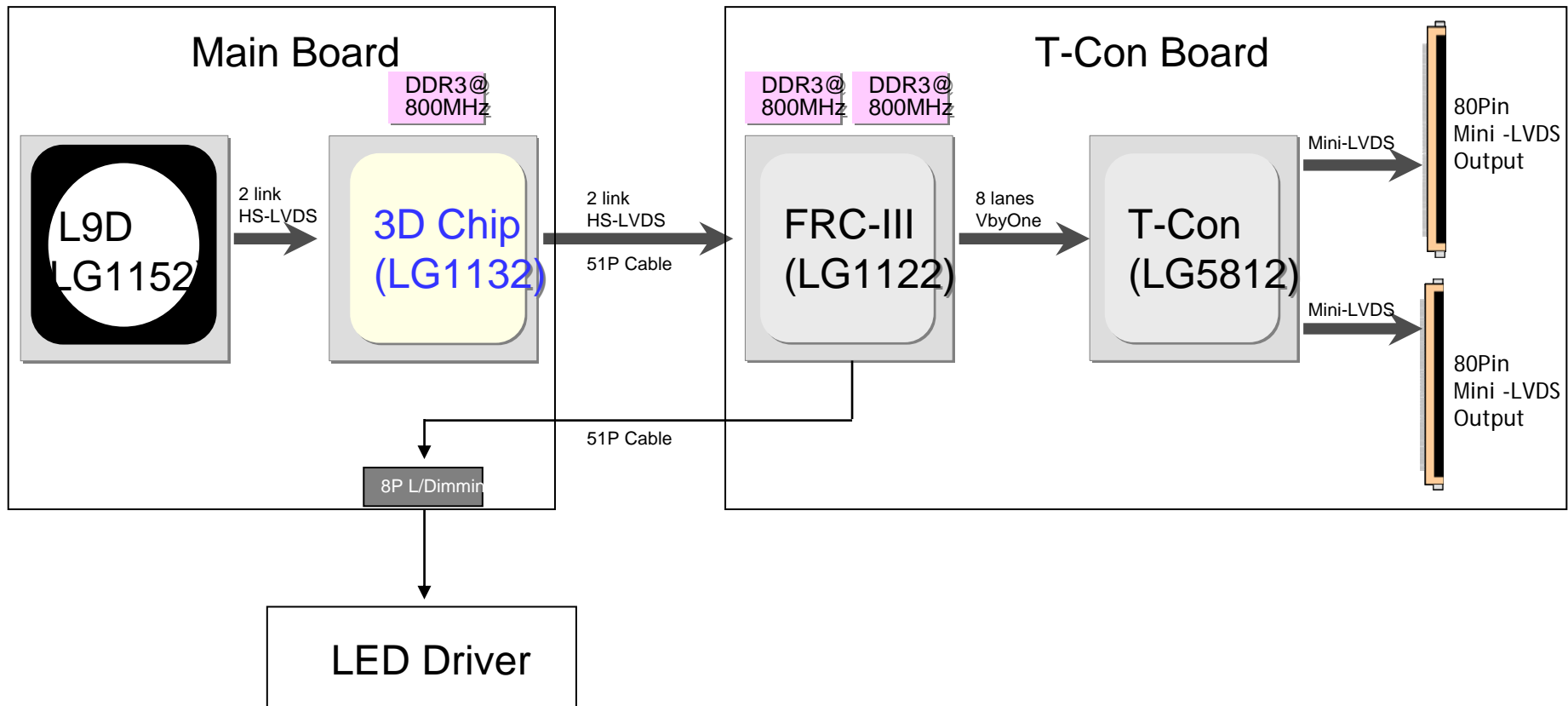
# L9 Block diagram



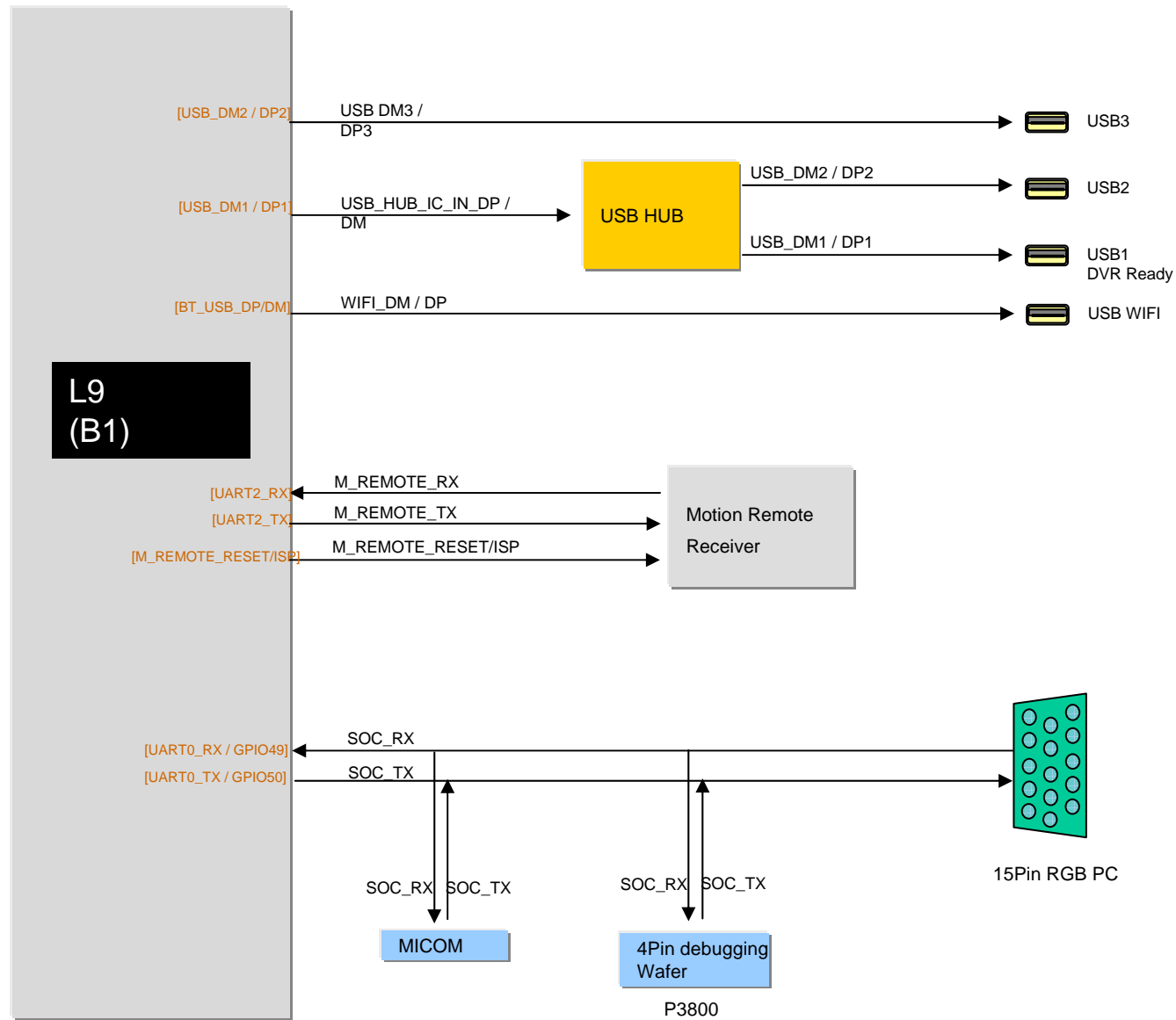
# L9 Block diagram



## 240Hz Backend Block diagram

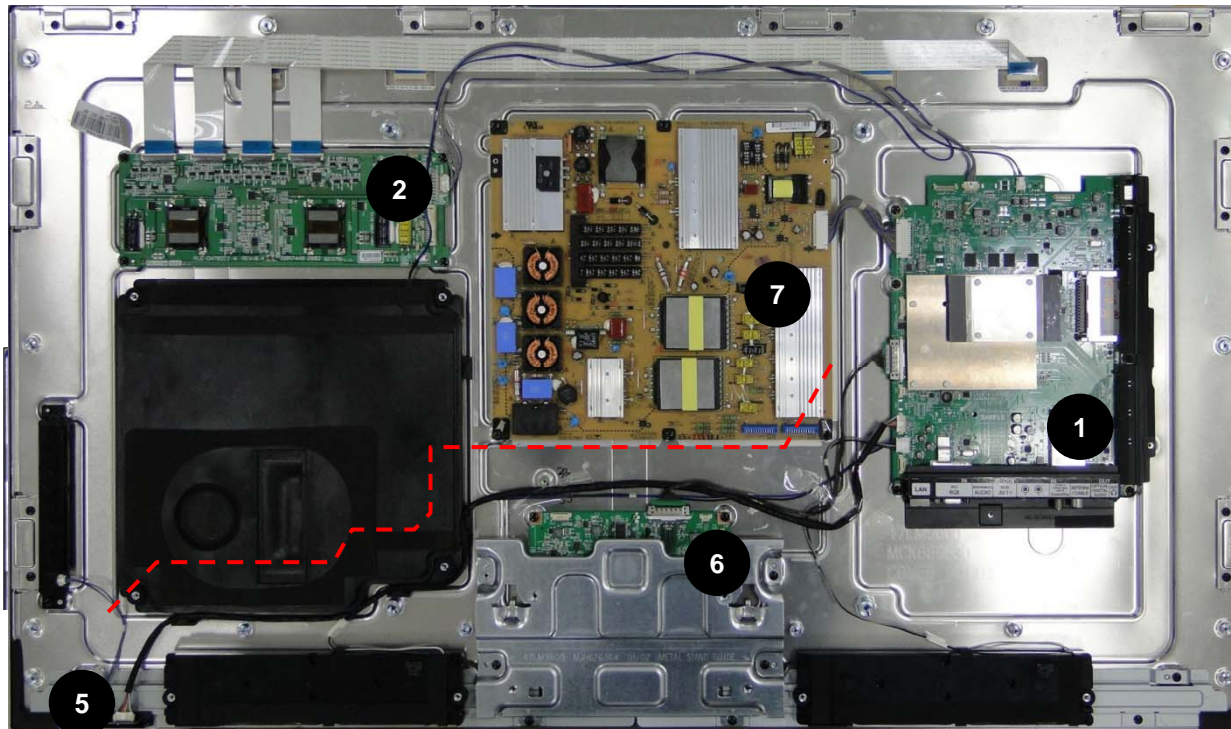


# L9 Block diagram



# Interconnection - 1

XXLM9600-NA

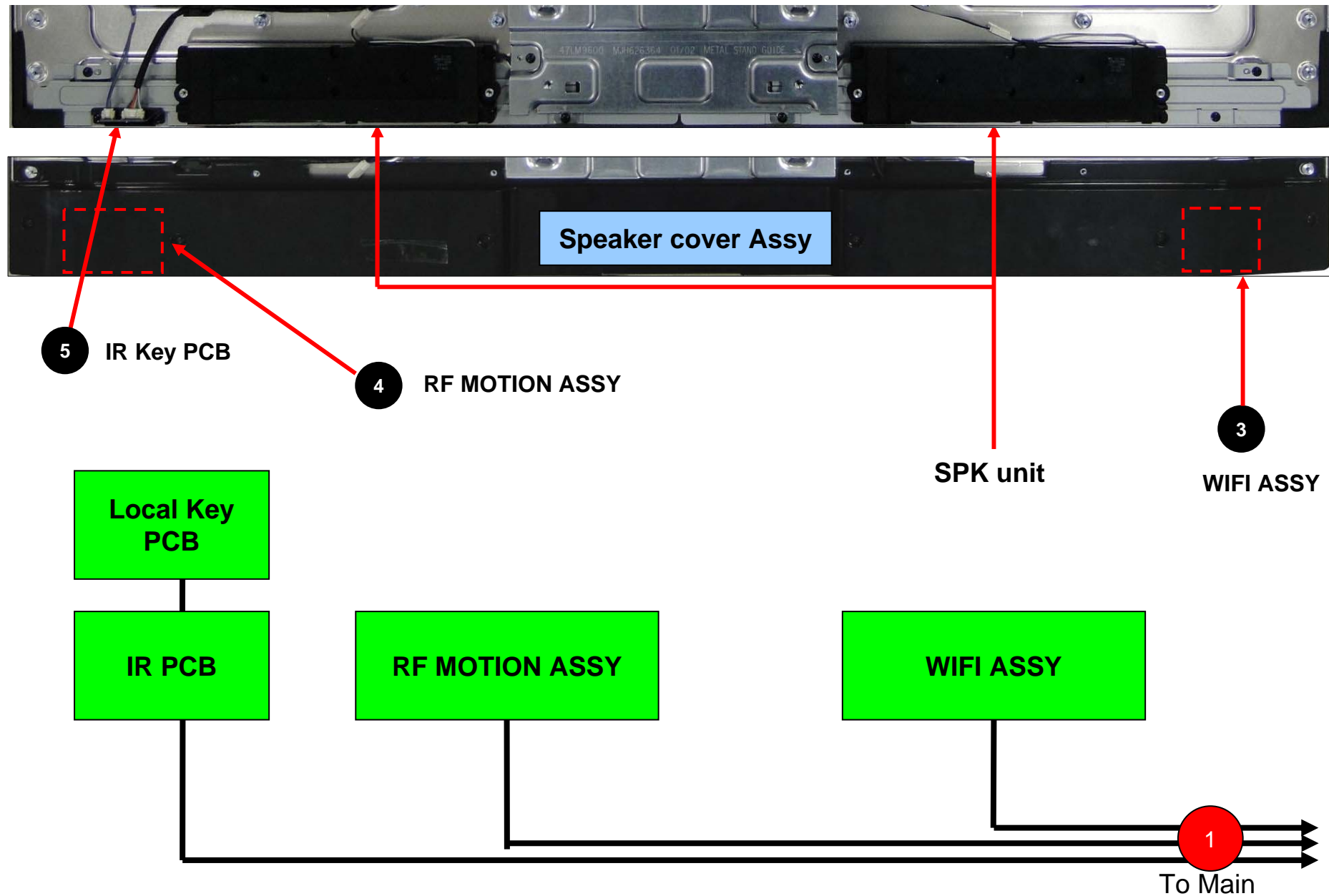


[PCBs]

- 1 Main PCB
- 2 LED driver
- 3 WIFI ASSY
- 4 RF MOTION ASSY
- 5 IR Key PCB
- 6 FRC ASSY
- 7 PSU



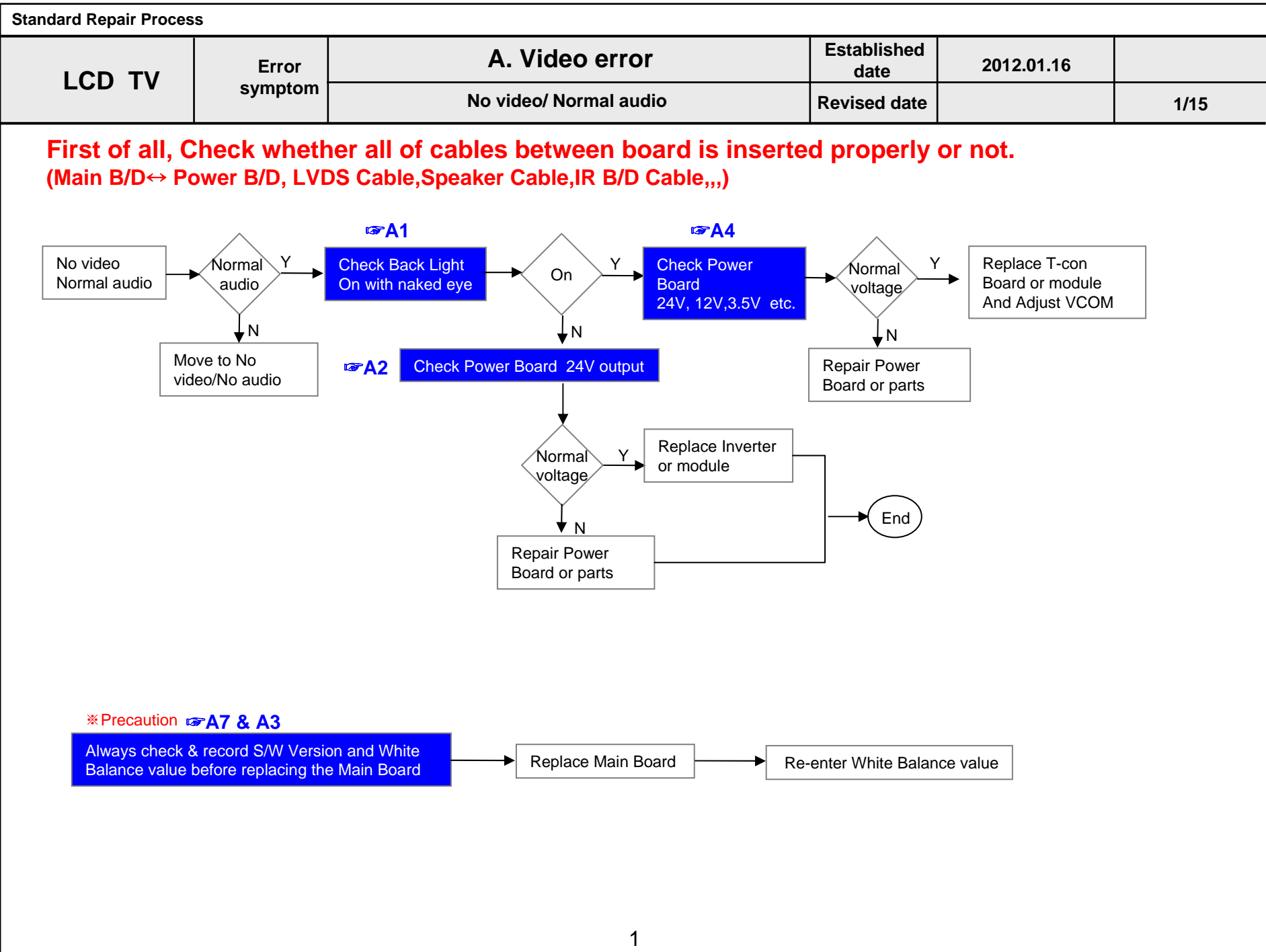
## Interconnection – sub PCB( XXLM9600 Series )

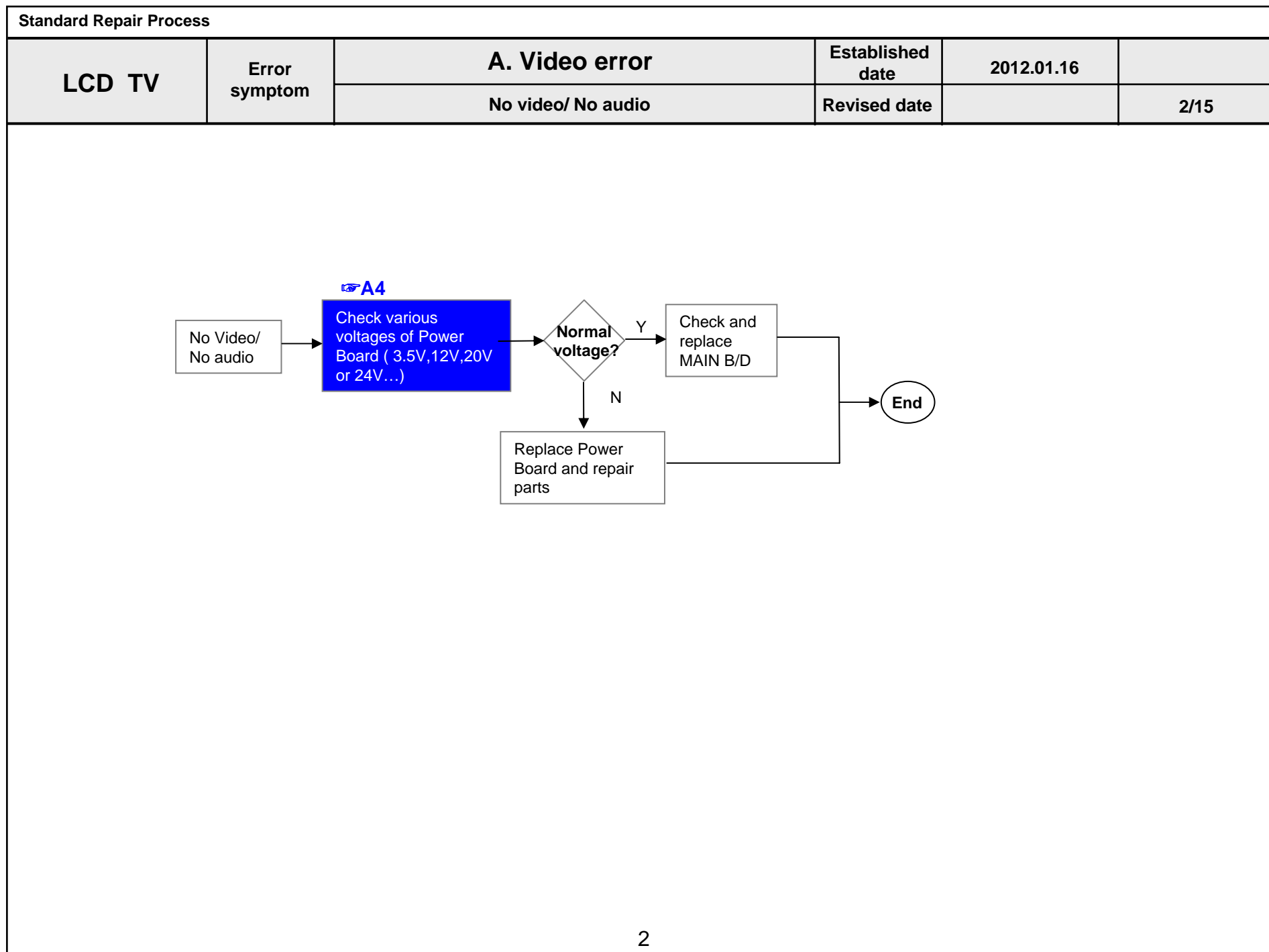


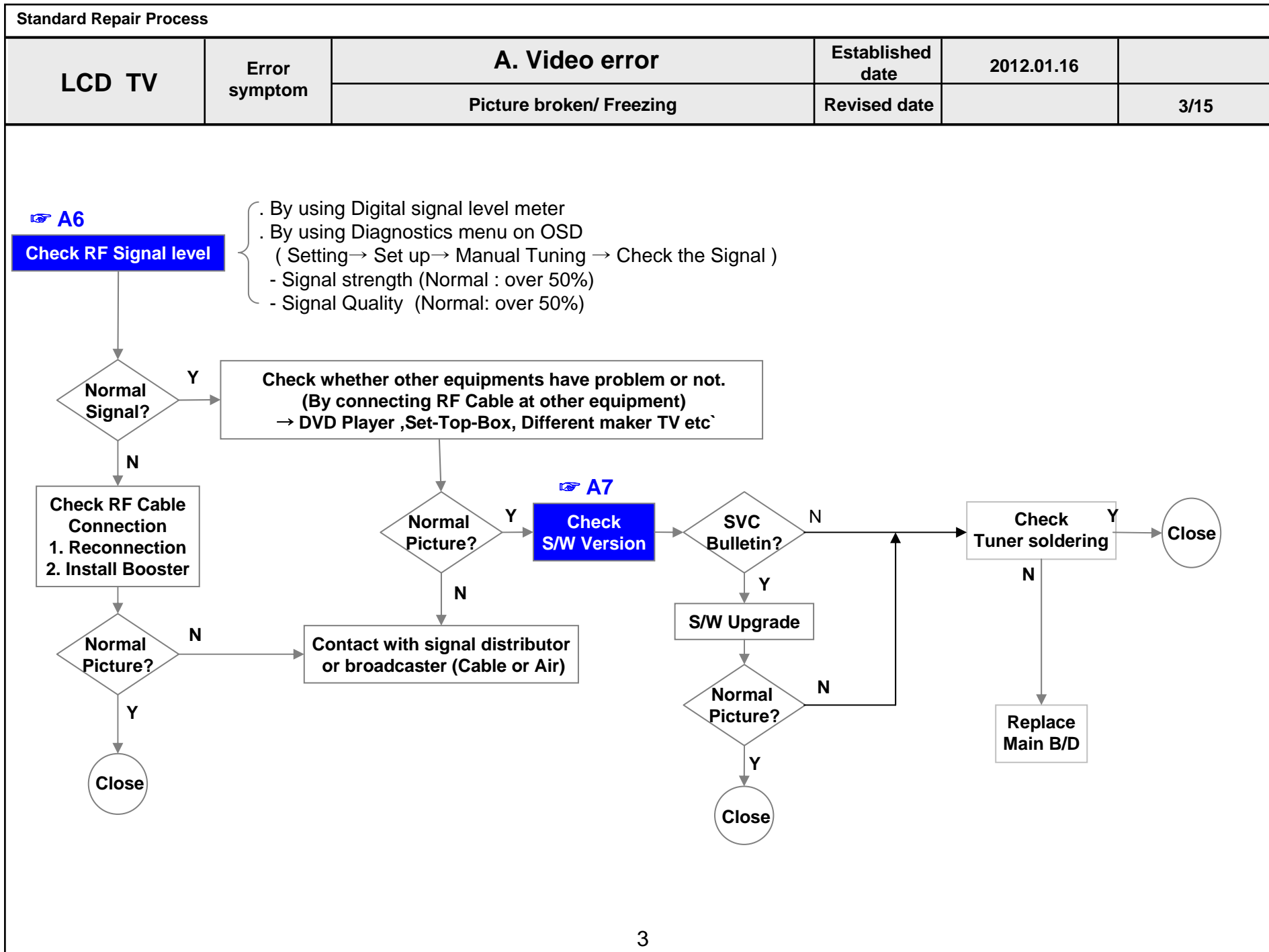
# Contents of LCD TV Standard Repair Process

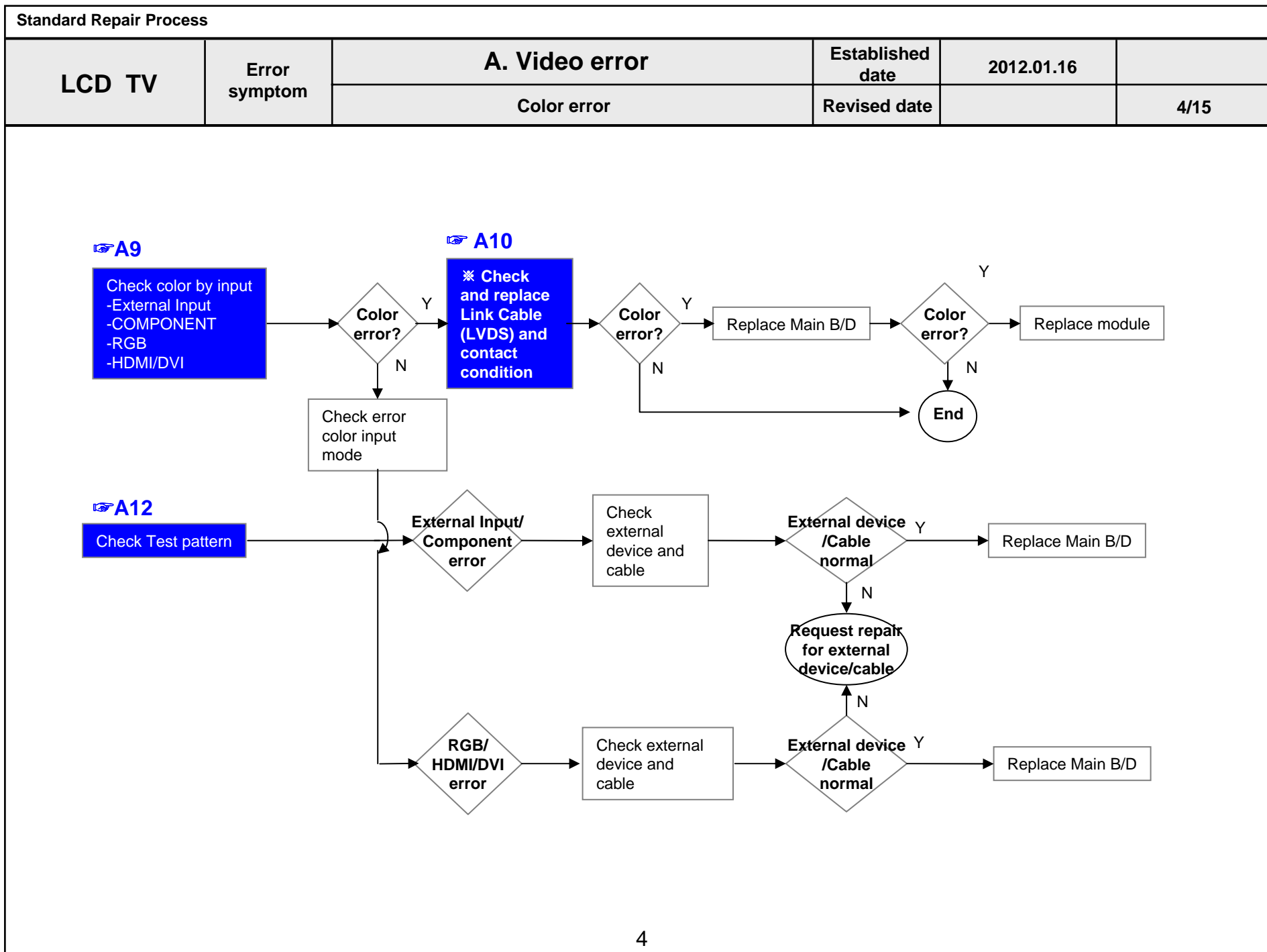
No.	Error symptom (High category)	Error symptom (Mid category)	Page	Remarks
1	A. Video error	No video/Normal audio	1	
2		No video/No audio	2	
3		Picture broken/ Freezing	3	
4		Color error	4	
5		Vertical/Horizontal bar, residual image, light spot, external device color error	5	
6	B. Power error	No power	6	
7		Off when on, off while viewing, power auto on/off	7	
8	C. Audio error	No audio/Normal video	8	
9		Wrecked audio/discontinuation/noise	9	
10	D. Function error	Remote control & Local switch checking	10	
11		M4 operating checking	11	
12		Wifi operating checking	12	
13		External device recognition error	13	
14	E. Noise	Circuit noise, mechanical noise	14	
15	F. Exterior error	Exterior defect	15	

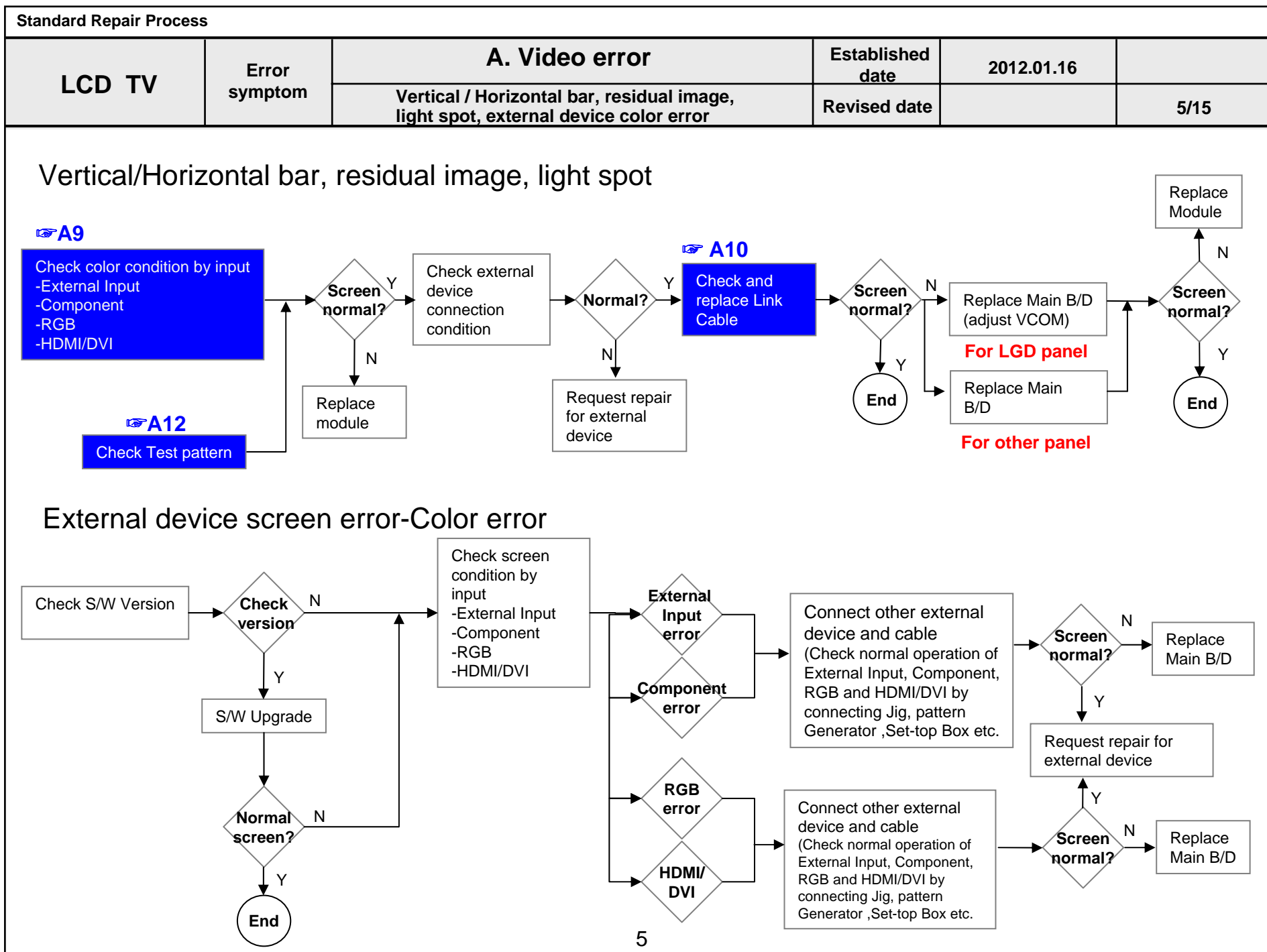
**First of all, Check whether there is SVC Bulletin in GCSC System for these model.**

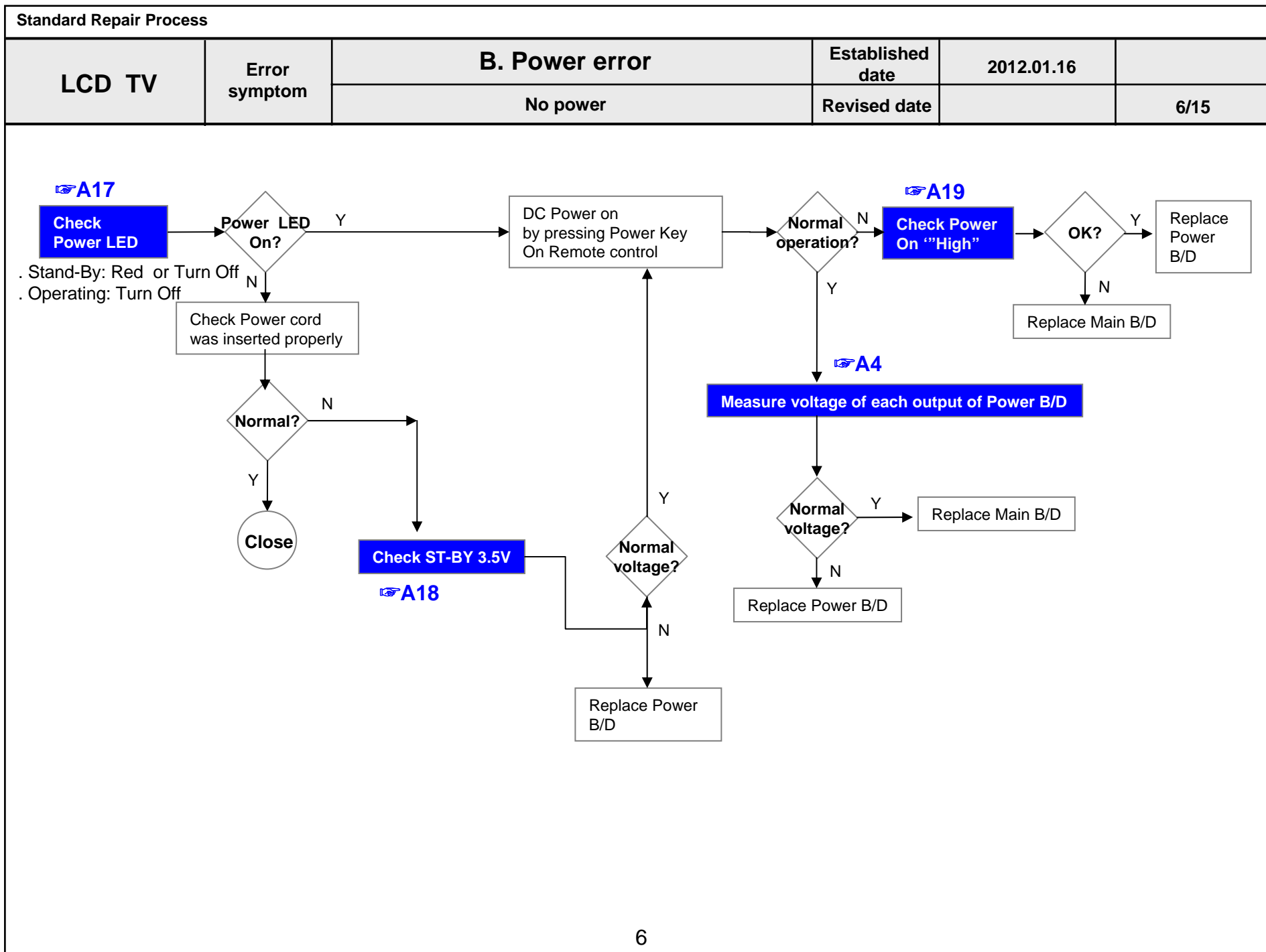


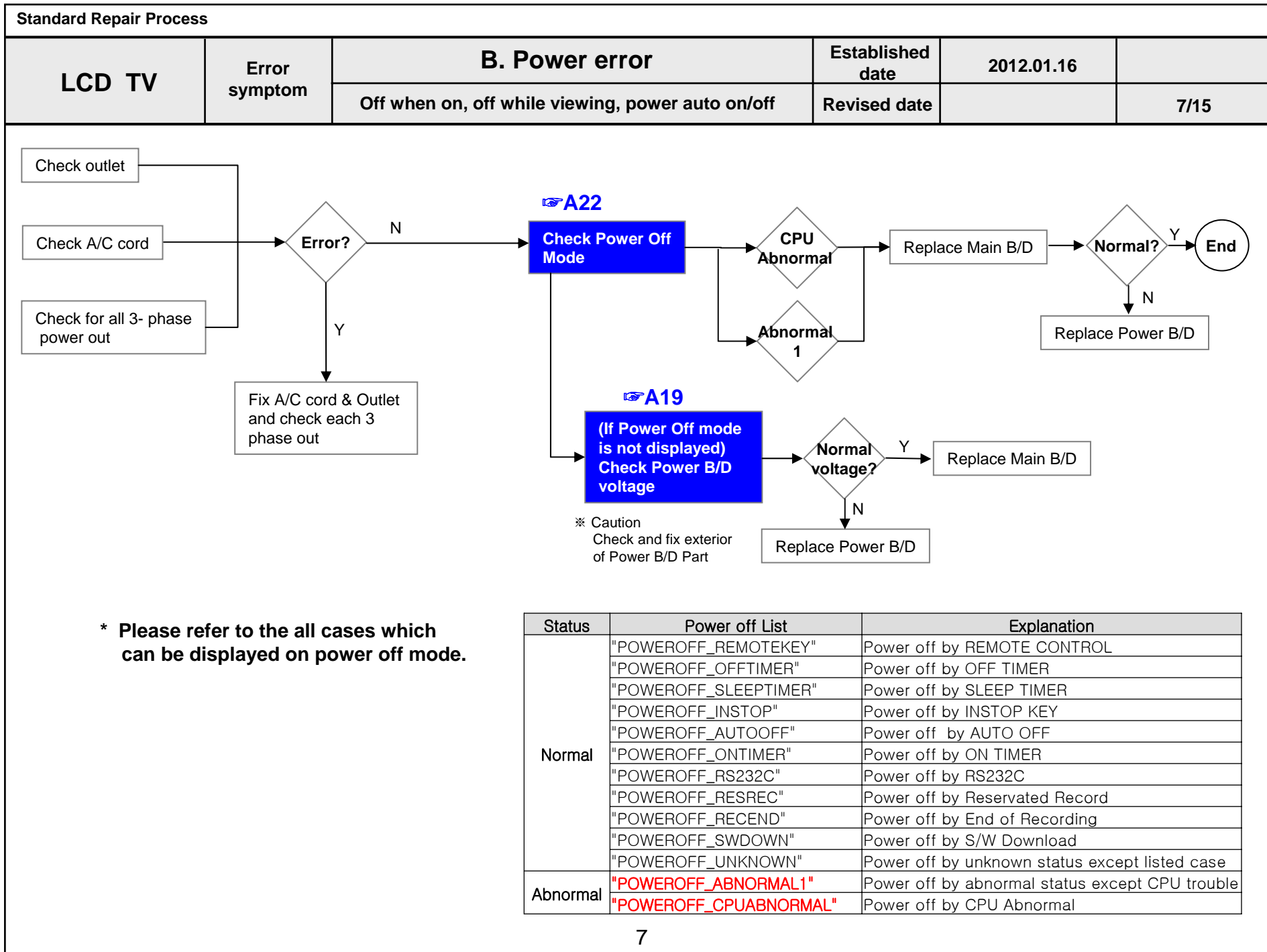






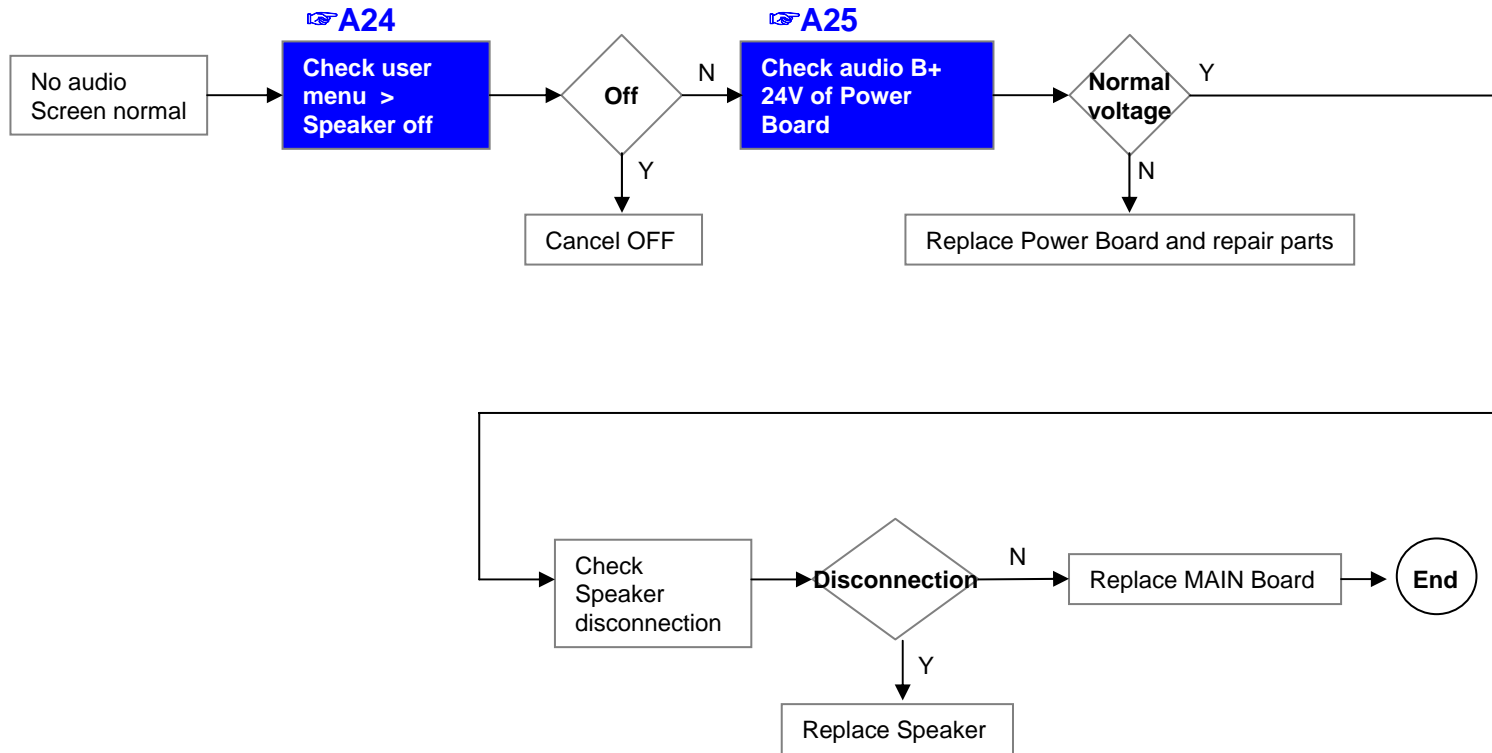


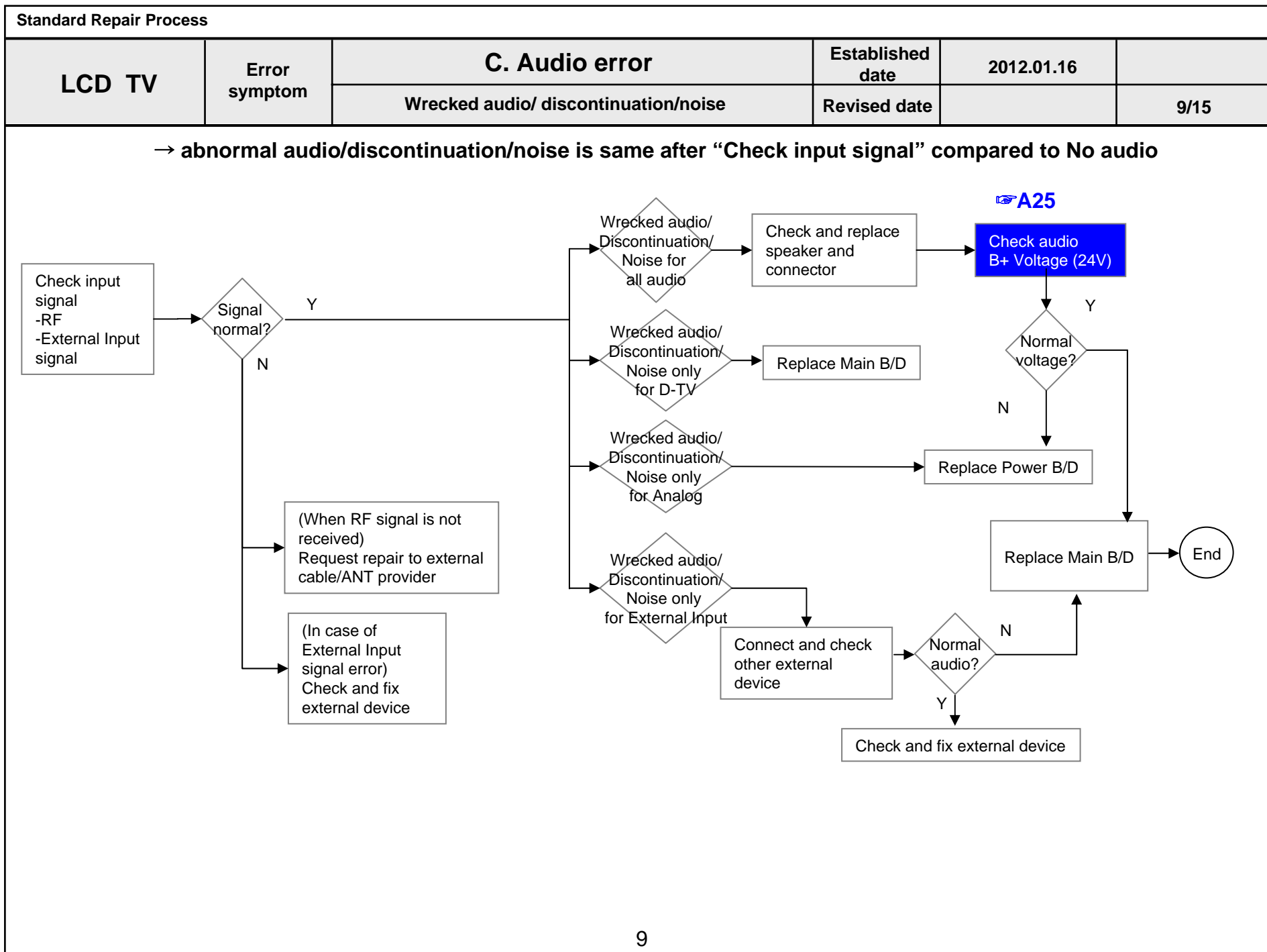


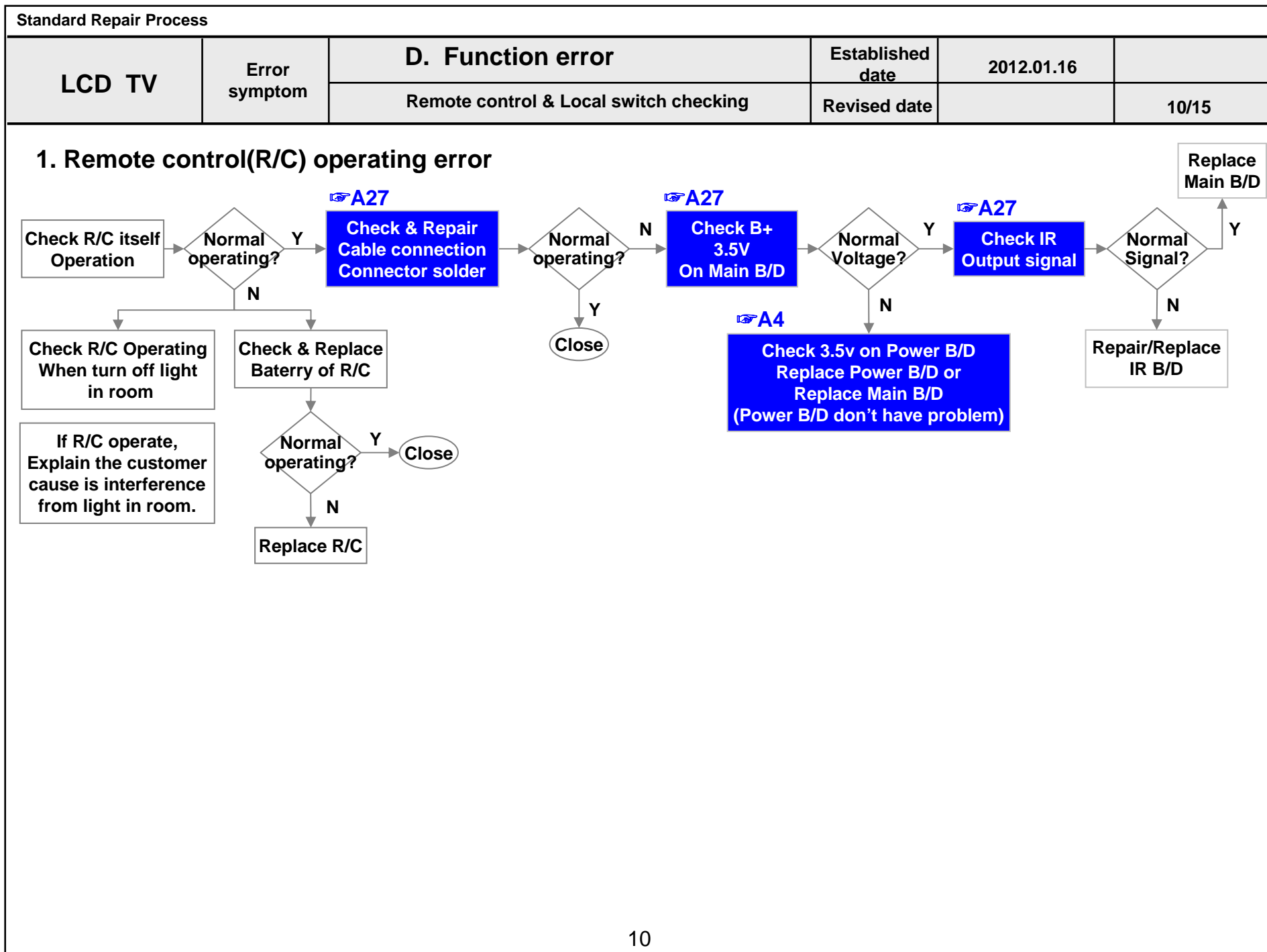


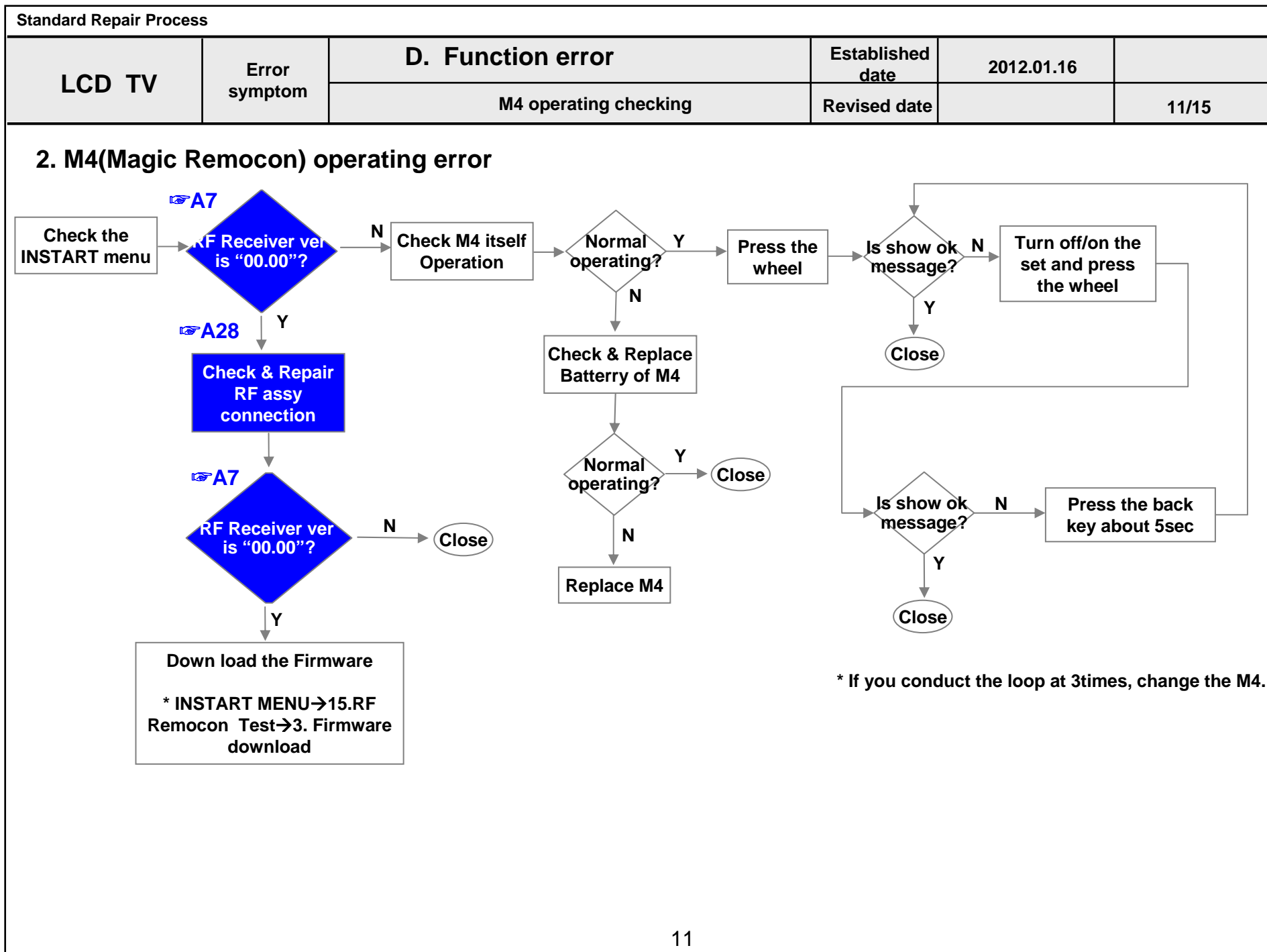
# Standard Repair Process

LCD TV	Error symptom	C. Audio error	Established date	2012.01.16	
		No audio/ Normal video	Revised date		8/15



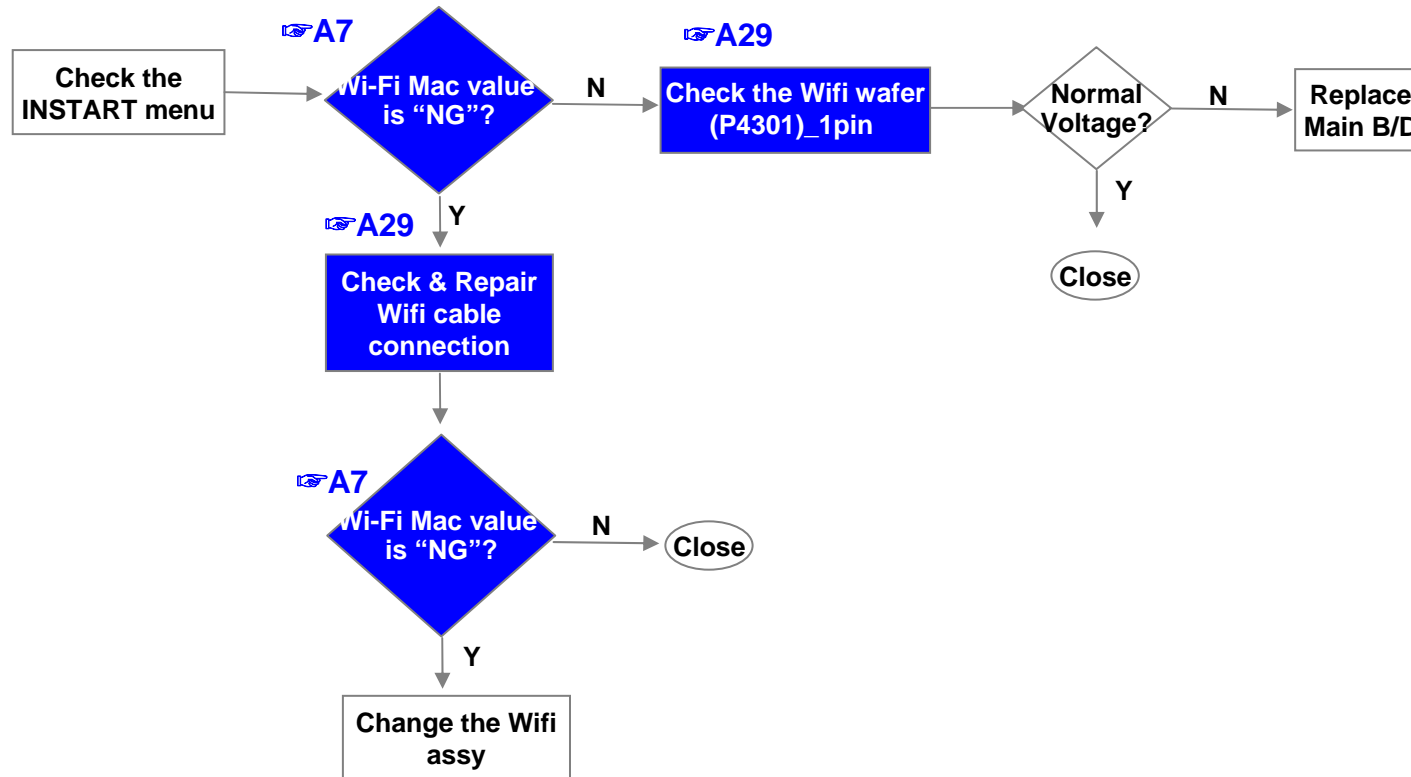


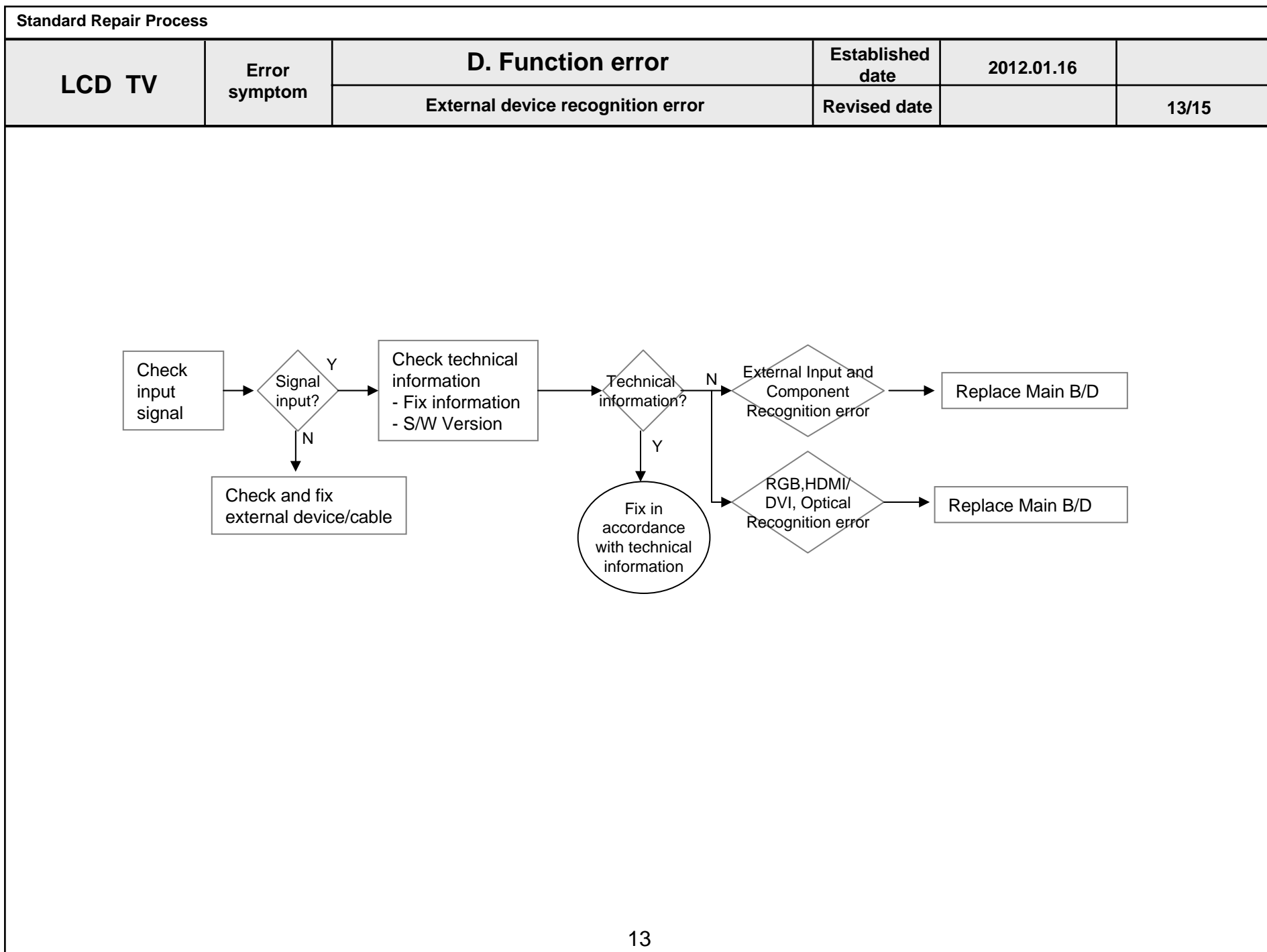


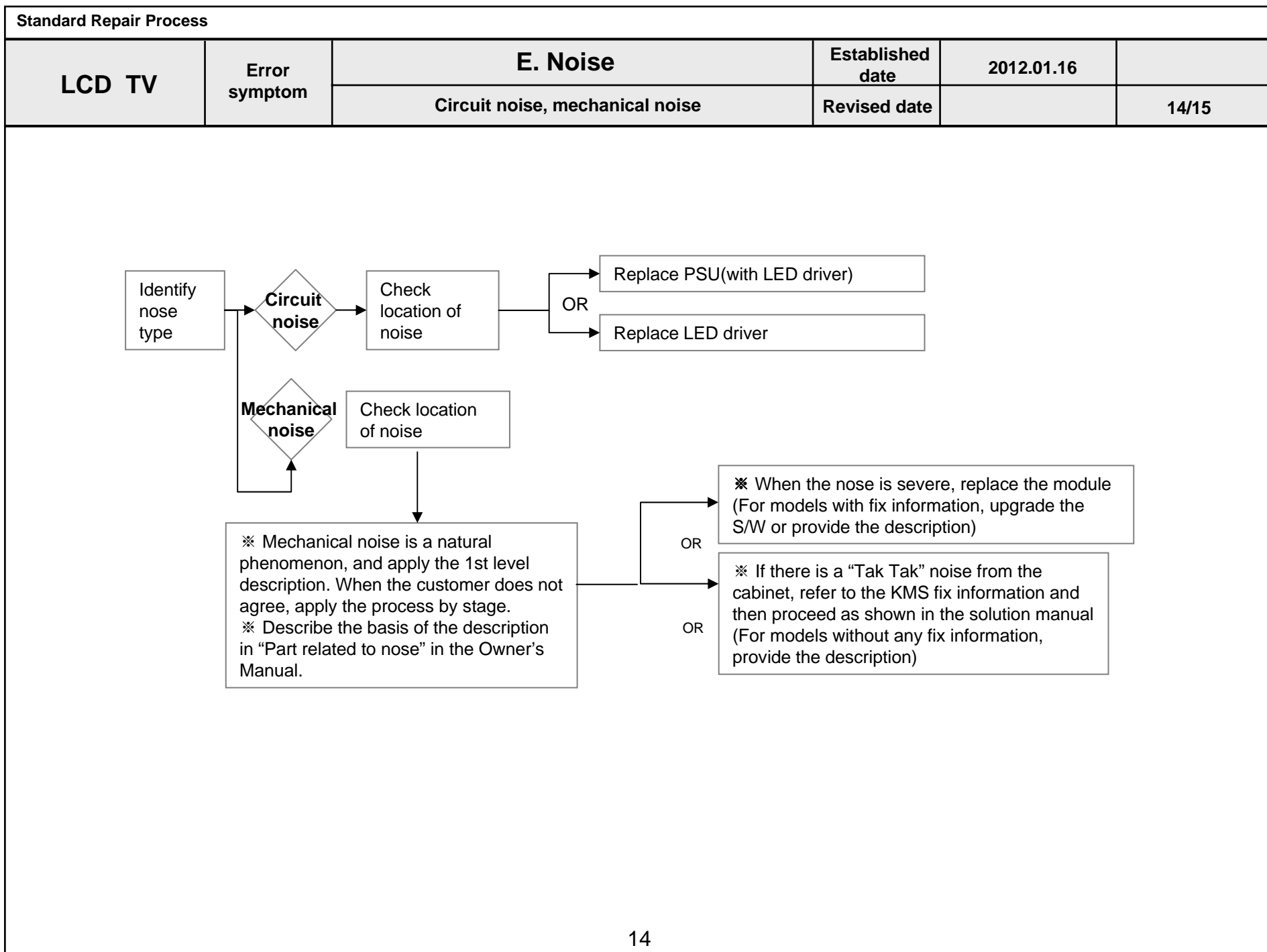


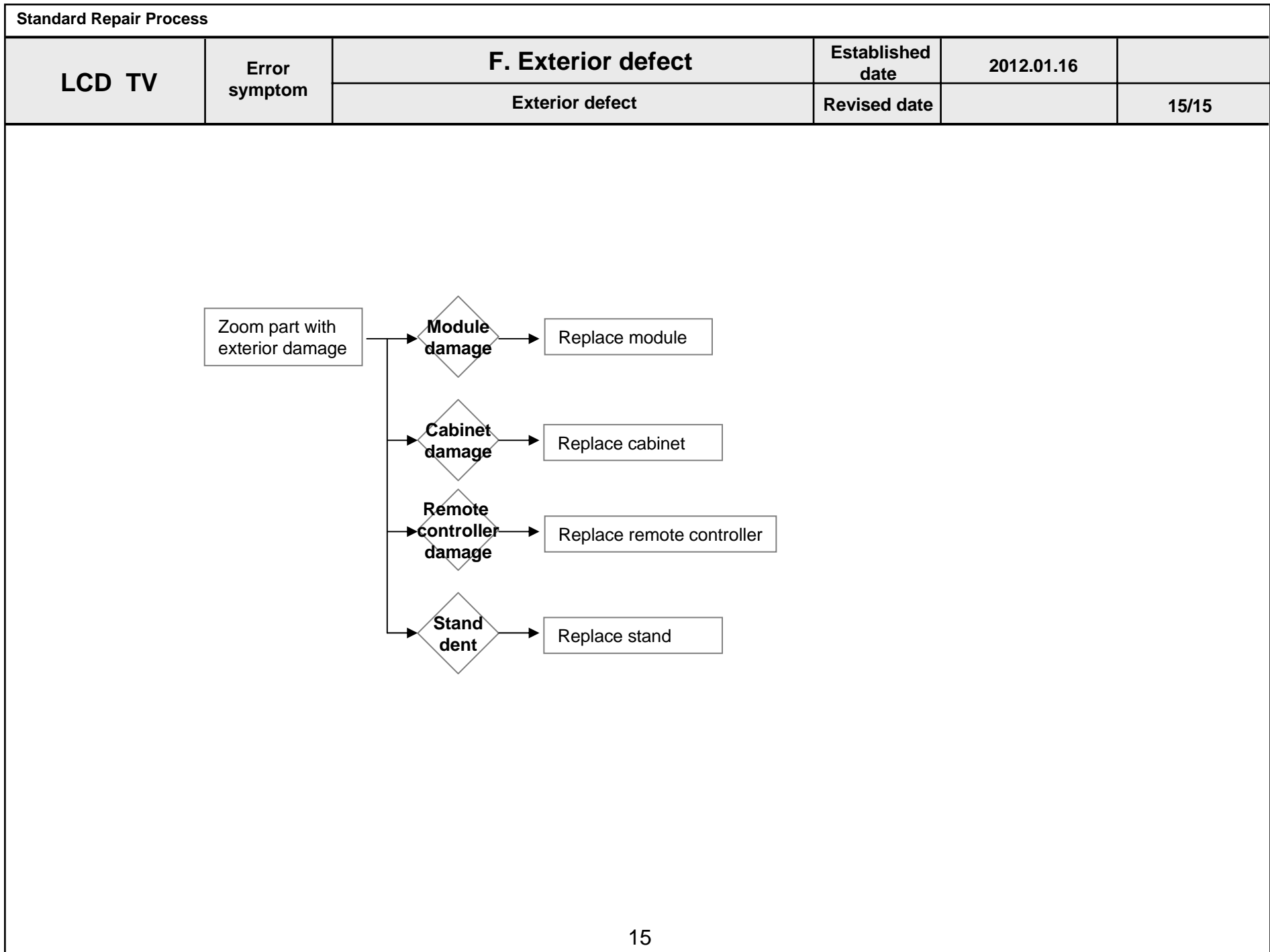
Standard Repair Process					
LCD TV	Error symptom	D. Function error	Established date	2012.01.16	
		Wifi operating checking	Revised date		12/15

### 3.Wifi operating error









# Contents of LCD TV Standard Repair Process Detail Technical Manual

No.	Error symptom	Content	Page	Remarks
1	A. Video error_ No video/Normal audio	Check LCD back light with naked eye	A1	
2		LED driver B+ 24V measuring method	A2	
3		Check White Balance value	A3	
4	A. Video error_ No video/Audio	Power Board voltage measuring method	A4	
5	A. Video error_ video error /Video lag/stop	TUNER input signal strength checking method	A6	
6		LCD-TV Version checking method	A7	
7		Tuner Checking Part	A8	
8	A. Video error _Vertical/Horizontal bar, residual image, light spot	LCD TV connection diagram	A9	
9	A. Video error_ Color error	Check Link Cable (LVDS) reconnection condition	A10	
10		Adjustment Test pattern – ADJ Key	A12	
11	<b>&lt;Appendix&gt;</b> Defected Type caused by T-Con/ Inverter/ Module	Exchange T-Con Board (1)	A-1/5	
12		Exchange T-Con Board (2)	A-2/5	
13		Exchange LED driver Board (PSU)	A-3/5	
14		Exchange Module (1)	A-4/5	
15		Exchange Module (2)	A-5/5	

**Continue to the next page**

# Contents of LCD TV Standard Repair Process Detail Technical Manual

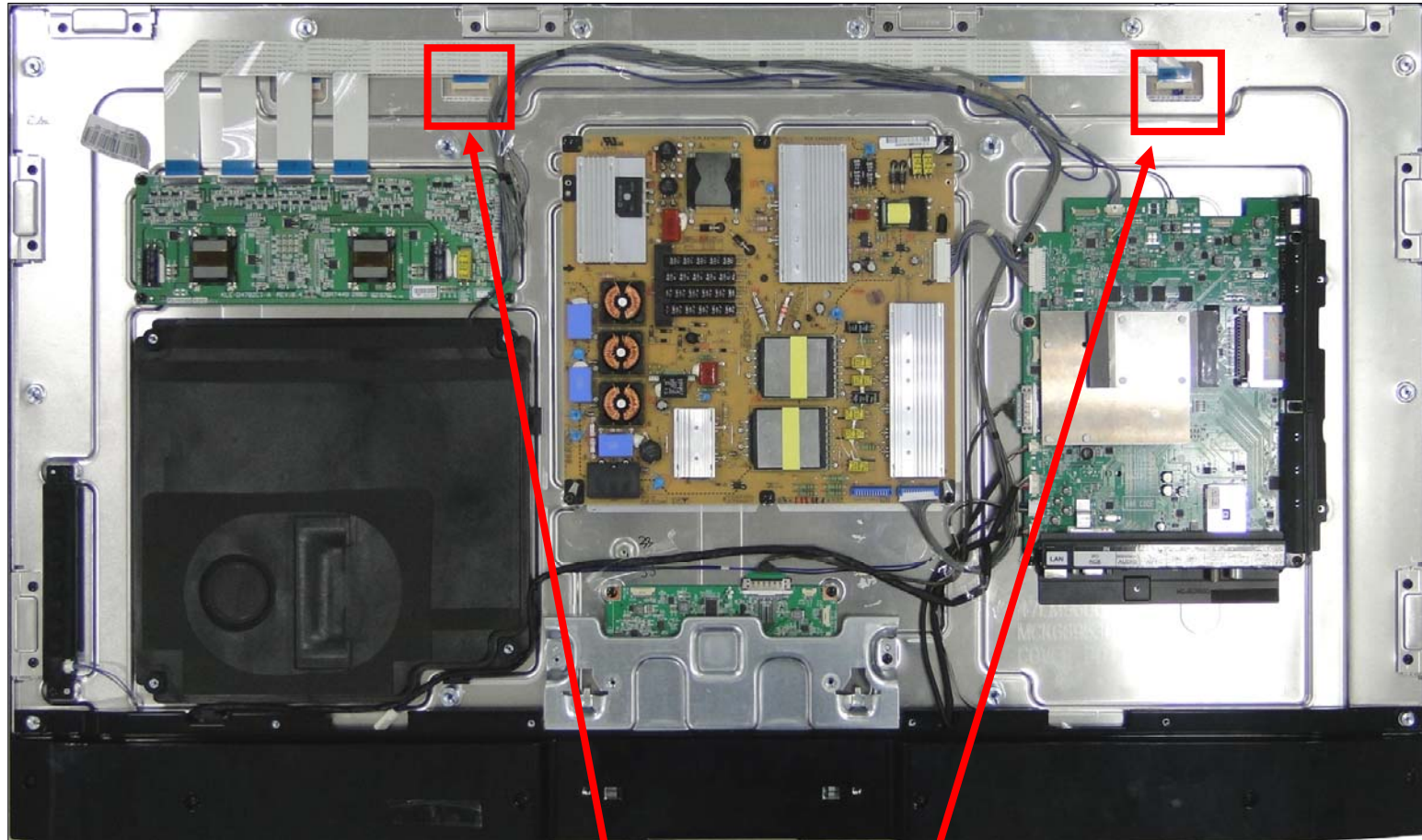
Continued from previous page

No.	Error symptom	Content	Page	Remarks
16	B. Power error_ No power	Check front display LED	A17	
17		Check power input Voltage & ST-BY 3.5V	A18	
18		Checking method when power is ON	A19	
19	B. Power error_Off when on, off while viewing	POWER OFF MODE checking method	A22	
20	C. Audio error_ No audio/Normal video	Checking method in menu when there is no audio	A24	
22		Voltage and speaker checking method when there is no audio	A25	
22	D. Function error	Remote controller operation checking method	A27	
23		Motion Remote operation checking method	A28	
24		Wifi operation checking method	A29	

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2011. 12 .14	
	Content	Check LCD back light with naked eye	Revised date		A1

<XXLM9600>



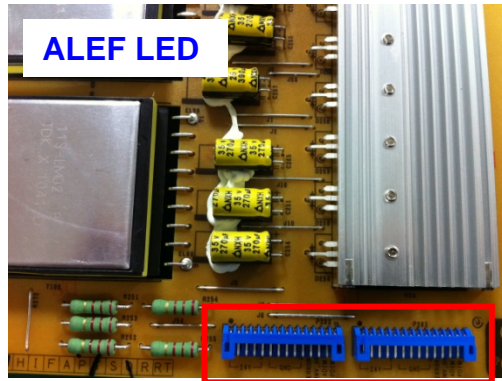
After turning on the power and disassembling the case, check with the naked eye, whether you can see light from 2 locations.

A1



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2011. 12 .14	
	Content	LED driver B+ 24V measuring method	Revised date		A2



Check the DC 24V and Inverter on

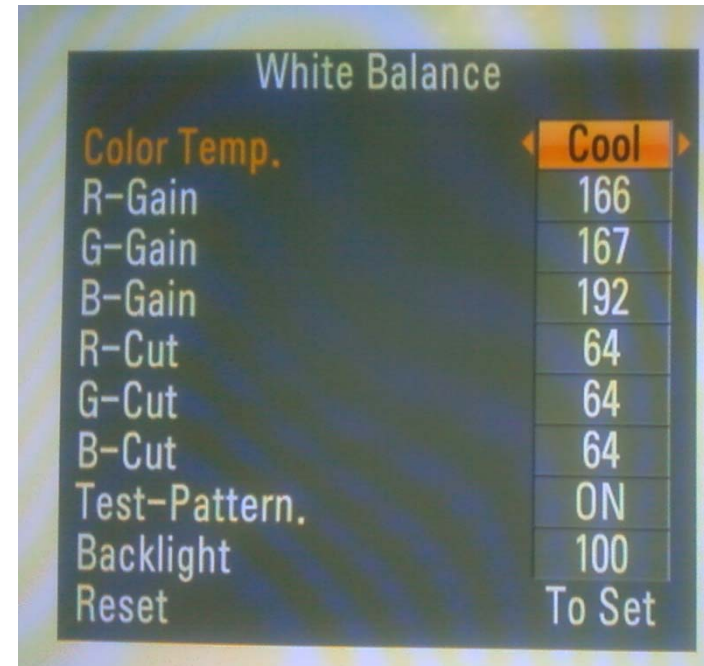
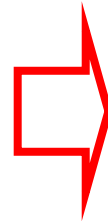
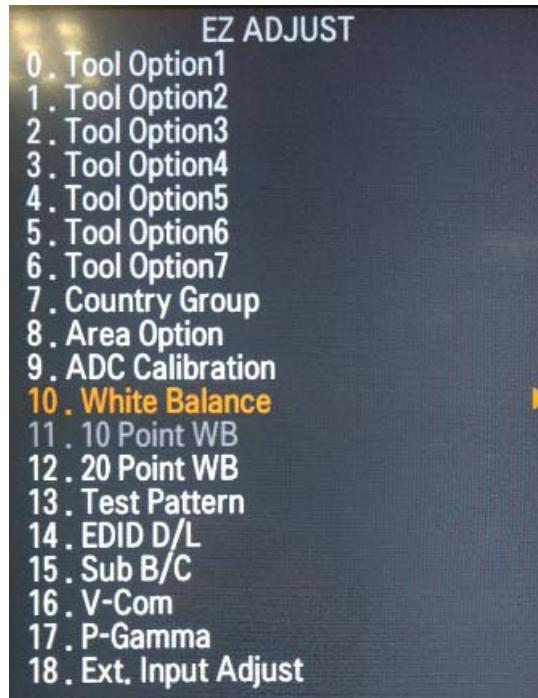
14 Pin (Power Board ↔ Driver) PSU	
1 ~ 5	24V
6 ~ 10	GND
11	Detect
12	Inverter On/Off
13	Int. PWM
14	Ext. PWM (PDIM)



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2011. 12 .14	
	Content	Check White Balance value	Revised date		A3

<ALL MODELS>



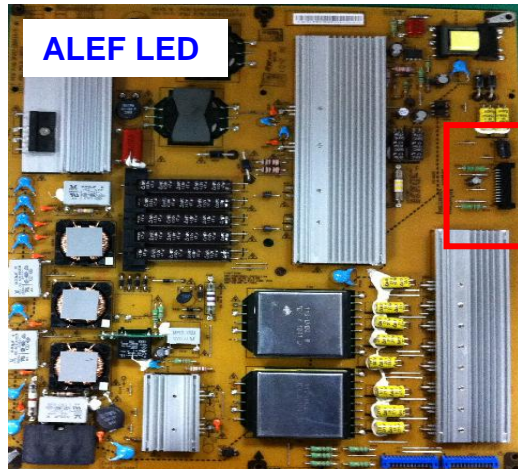
## Entry method

1. Press the ADJ button on the remote controller for adjustment.
2. Enter into White Balance of item 10.
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/ Audio	Established date	2011. 12 .14	
	Content	Power Board voltage measuring method	Revised date		A4



Check the DC 24V, 12V, 3.5V.

24 Pin (Power Board ↔ Main Board) – 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C (Only LPB : V-sync)
17	12V	18	Inverter On/off
19	12V	20	N.C (LPB, Lamp : A-dim)
21	12V	22	PWM Dim #1
23	N.C (only Lamp SCANNING Model : PWM Dim #2)	24	Error-out

A4



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2011. 12 .14	
	Content	TUNER input signal strength checking method	Revised date		A6

<ALL MODELS>



Settings → Set up → Manual Tuning  
→ select channel



When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)



A6

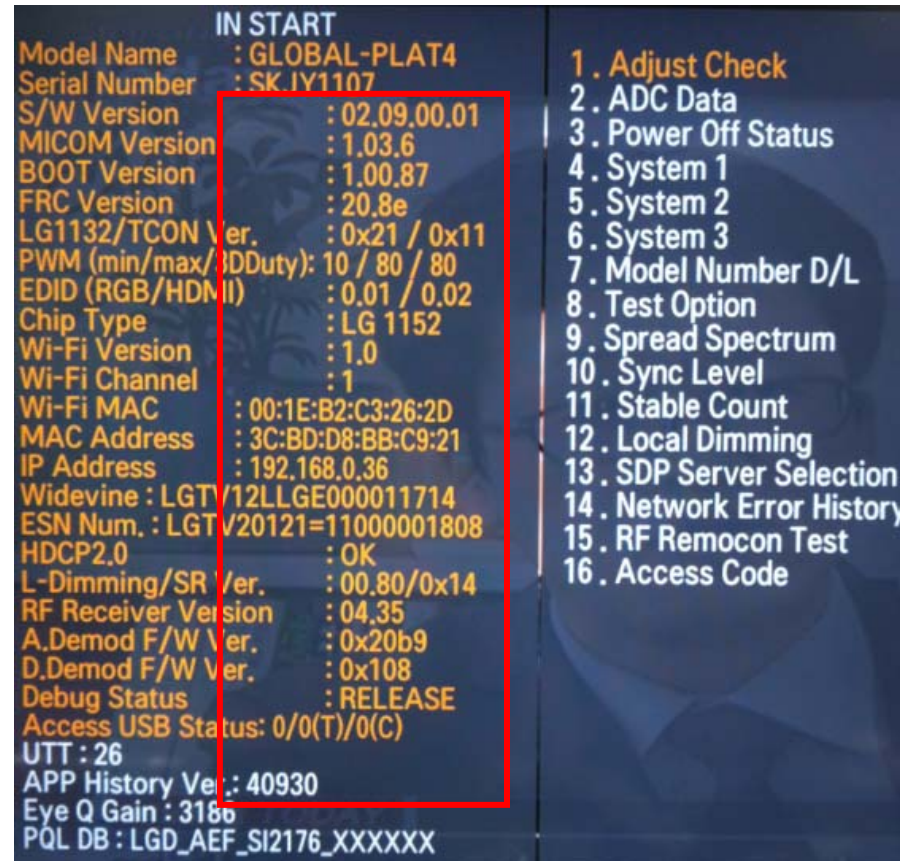
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2011. 12 .14	
	Content	LCD-TV Version checking method	Revised date		A7

<ALL MODELS>

## 1. Checking method for remote controller for adjustment

Version



Press the IN-START with the remote controller for adjustment

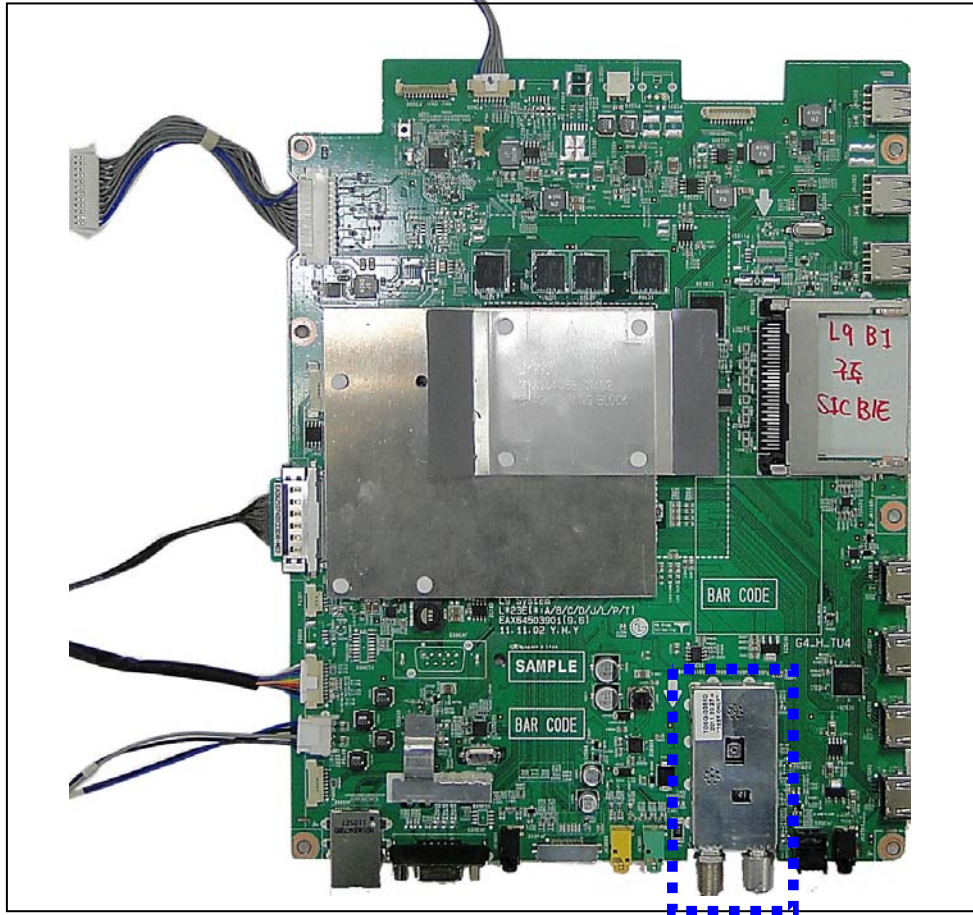
A7



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2011. 12 .14	
	Content	TUNER checking part	Revised date		A8

<ALL MODELS>



Checking method:

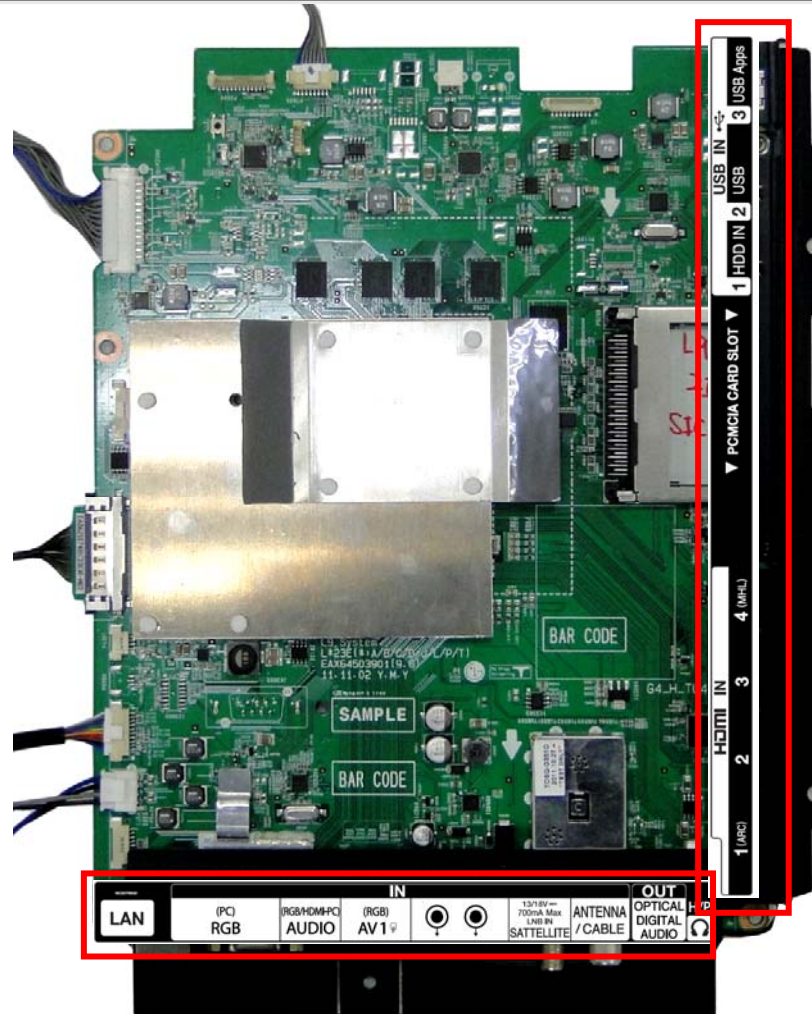
1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.

A8

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error _ Vertical/Horizontal bar, residual image, light spot	Established date	2011. 12 .14	
	Content	LCD TV connection diagram (1)	Revised date		A9

<ALL MODELS>



As the part connecting to the external input, check the screen condition by signal

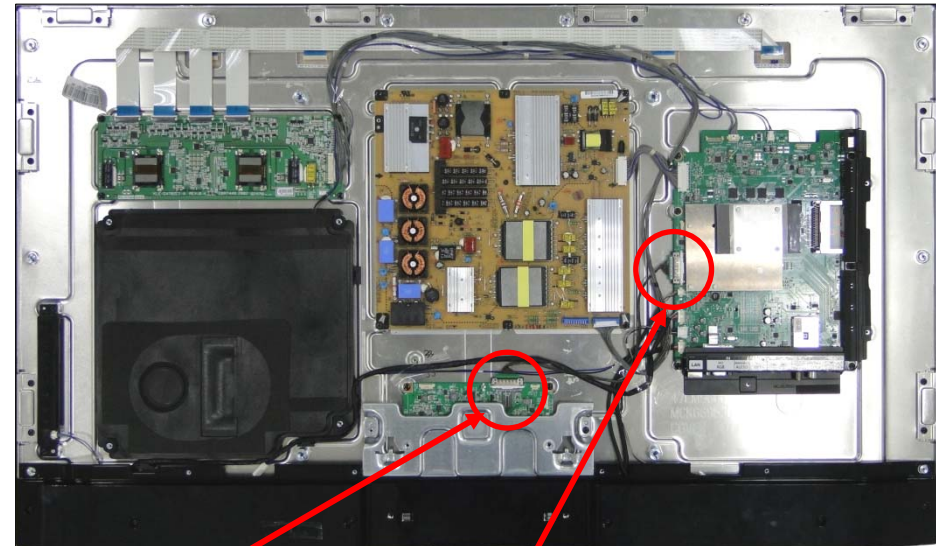
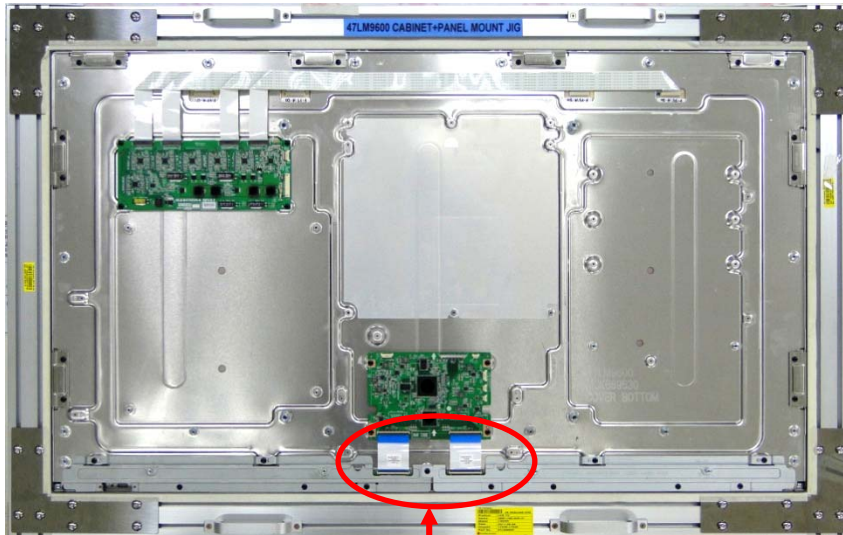
A9



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2011. 12 .14	
	Content	Check Link Cable (LVDS) reconnection condition	Revised date		A10

<ALL MODELS>



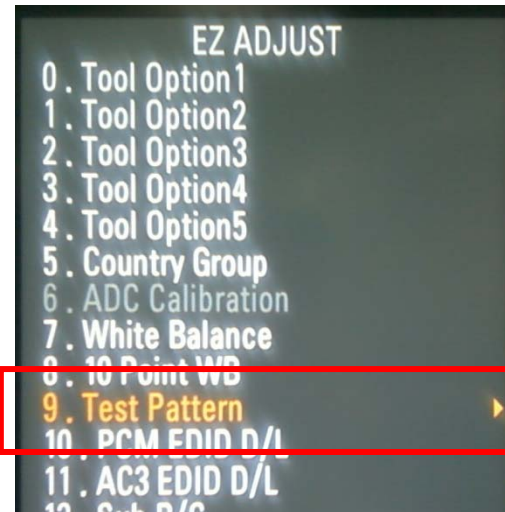
Check the contact condition of the Link Cable, especially dust or mis insertion.

A10



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2011. 12 .14	
	Content	Adjustment Test pattern - ADJ Key	Revised date		A12



You can view 6 types of patterns using the ADJ Key

Checking item : 1. Defective pixel 2. Residual image 3. MODULE error (ADD-BAR,SCAN BAR..)  
4.Video error (Classification of MODULE or Main-B/D!)

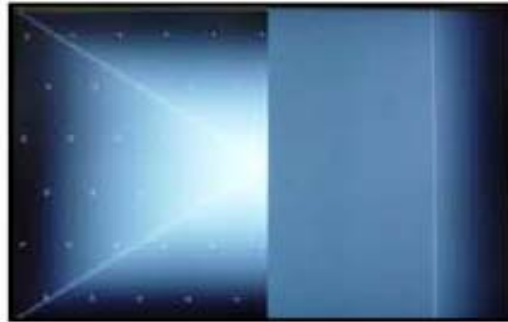
A12



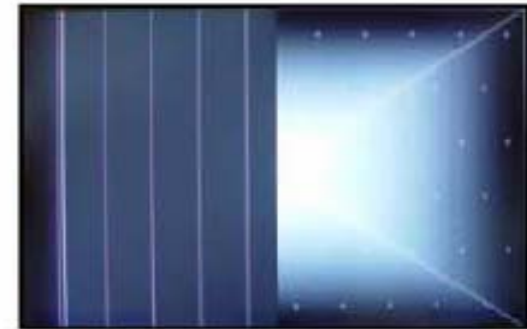
## Appendix : Exchange T-Con Board (1)



Solder defect, CNT Broken



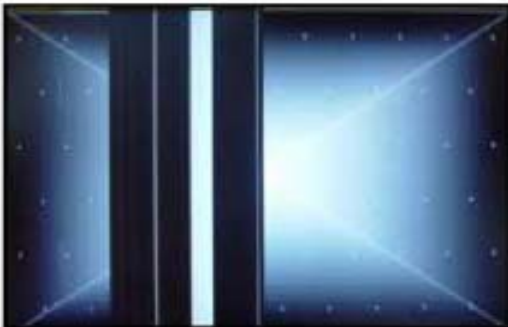
Solder defect, CNT Broken



Solder defect, CNT Broken



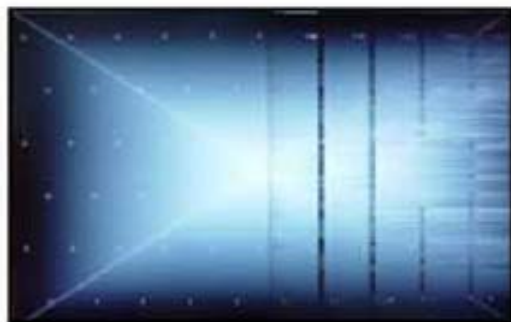
Solder defect, CNT Broken



Solder defect, CNT Broken



Abnormal Power Section



Solder defect, Short/Crack

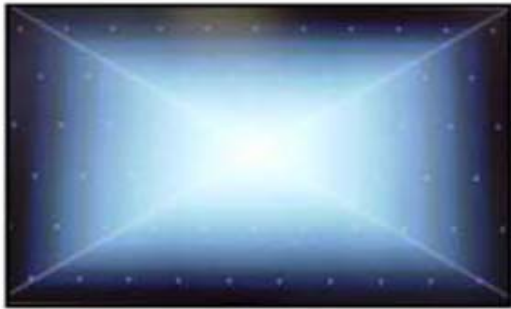


Abnormal Power Section



Solder defect, Short/Crack

## Appendix : Exchange T-Con Board (2)



Abnormal Power Section



Abnormal Power Section



Solder defect, Short/Crack



Solder defect, Short/Crack



Fuse Open, Abnormal power section



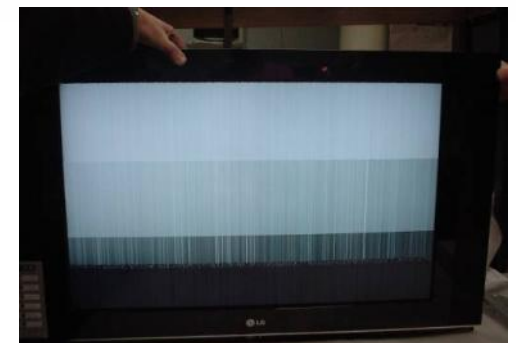
Abnormal Display



GRADATION



Noise



GRADATION

## Appendix : Exchange LED driver Board (PSU)



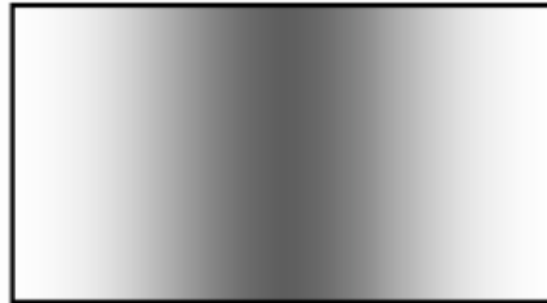
No Light



Dim Light



Dim Light



Dim Light



No picture/Sound Ok

## Appendix : Exchange the Module (1)



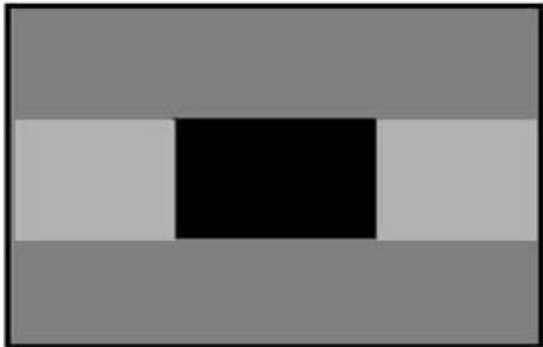
Panel Mura, Light leakage



Panel Mura, Light leakage



Press damage



Crosstalk



Press damage



Crosstalk

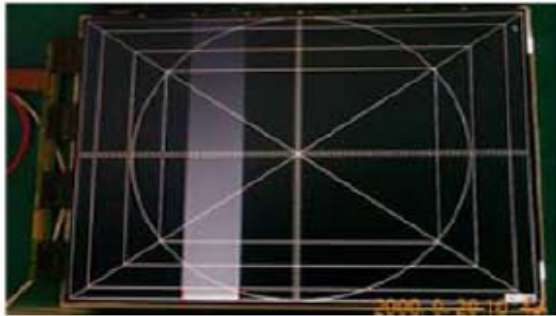


Press damage

### Un-repairable Cases

In this case please exchange the module.

## Appendix : Exchange the Module (2)



Vertical Block  
Source TAB IC Defect



Vertical Line  
Source TAB IC Defect



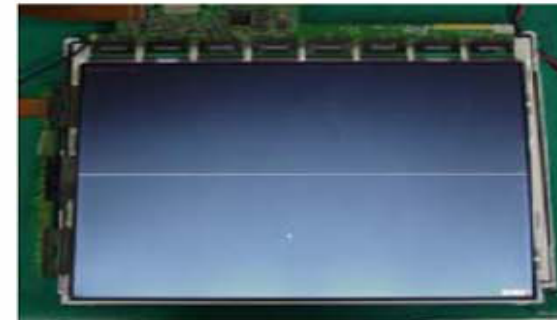
Vertical Block  
Source TAB IC Defect



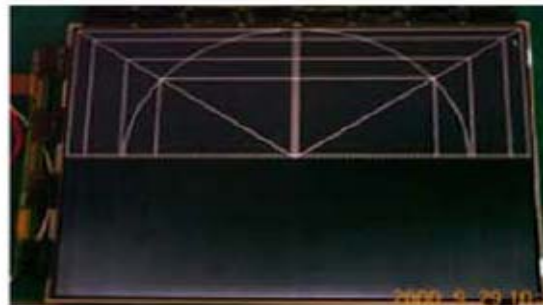
Horizontal Block  
Gate TAB IC Defect



Horizontal Block  
Gate TAB IC Defect



Horizontal line  
Gate TAB IC Defect



Horizontal Block  
Gate TAB IC Defect

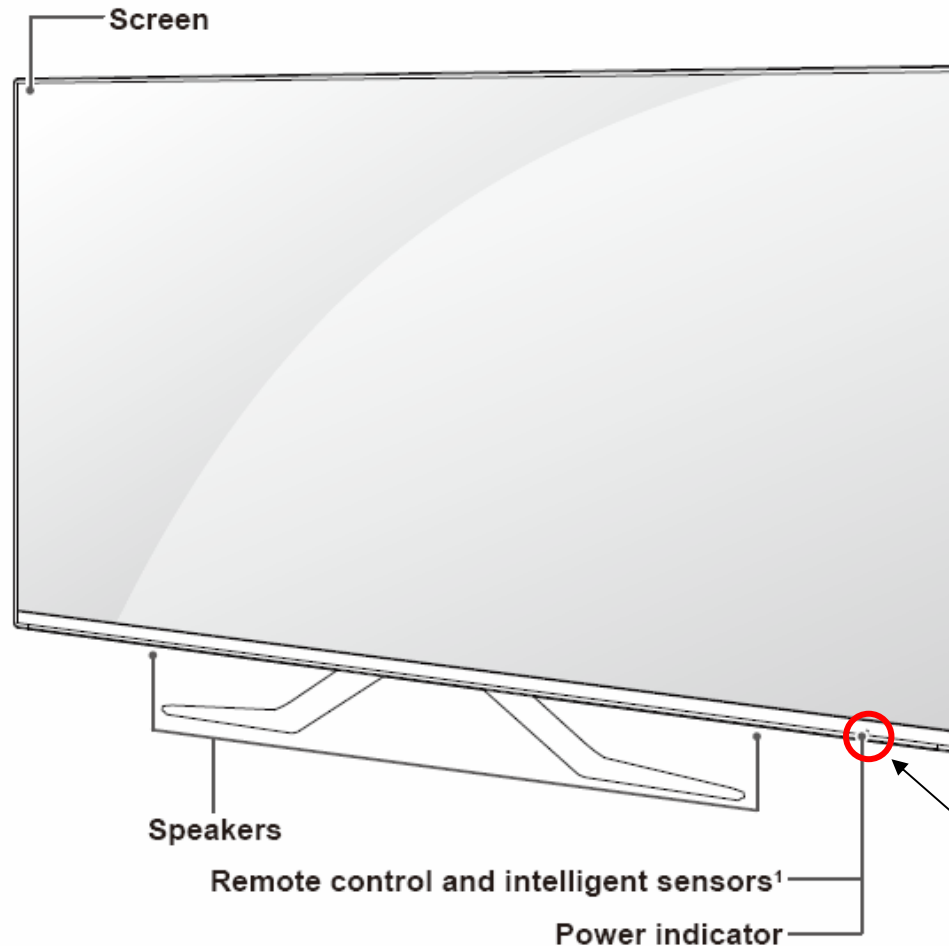
### Un-repairable Cases

**In this case please exchange the module.**

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2011. 12 .14	
	Content	Check front display LED	Revised date		A17

<XXLM9600>



Front LED control :  
Menu → Option →  
Standby Light  
→ ON/ Off

ST-BY condition: Red or Turn Off  
Power ON condition: Turn Off

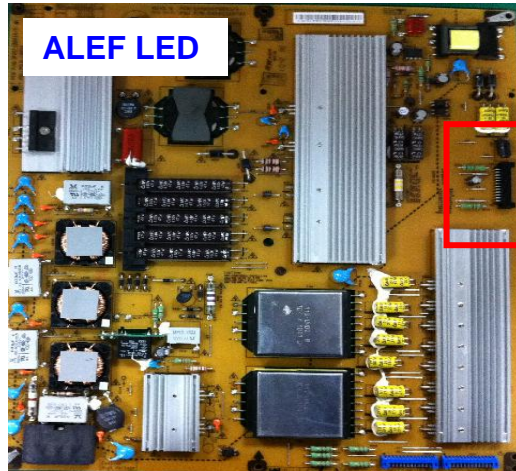
A17



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2011. 12 .14	
	Content	Check power input voltage and ST-BY 3.5V	Revised date		A18

<XXLM9600>



Check the DC 24V, 12V, 3.5V.

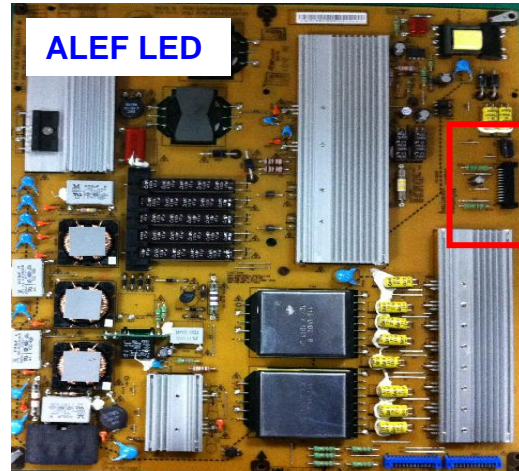
24 Pin (Power Board ↔ Main Board) – 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C (Only LPB : V-sync)
17	12V	18	Inverter On/off
19	12V	20	N.C (LPB, Lamp : A-dim)
21	12V	22	PWM Dim #1
23	N.C (only Lamp SCANNING Model : PWM Dim #2)	24	Error-out



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2011. 12 .14	
	Content	Checking method when power is ON	Revised date		A19

<XXLM9600>



Check "power on" pin is high

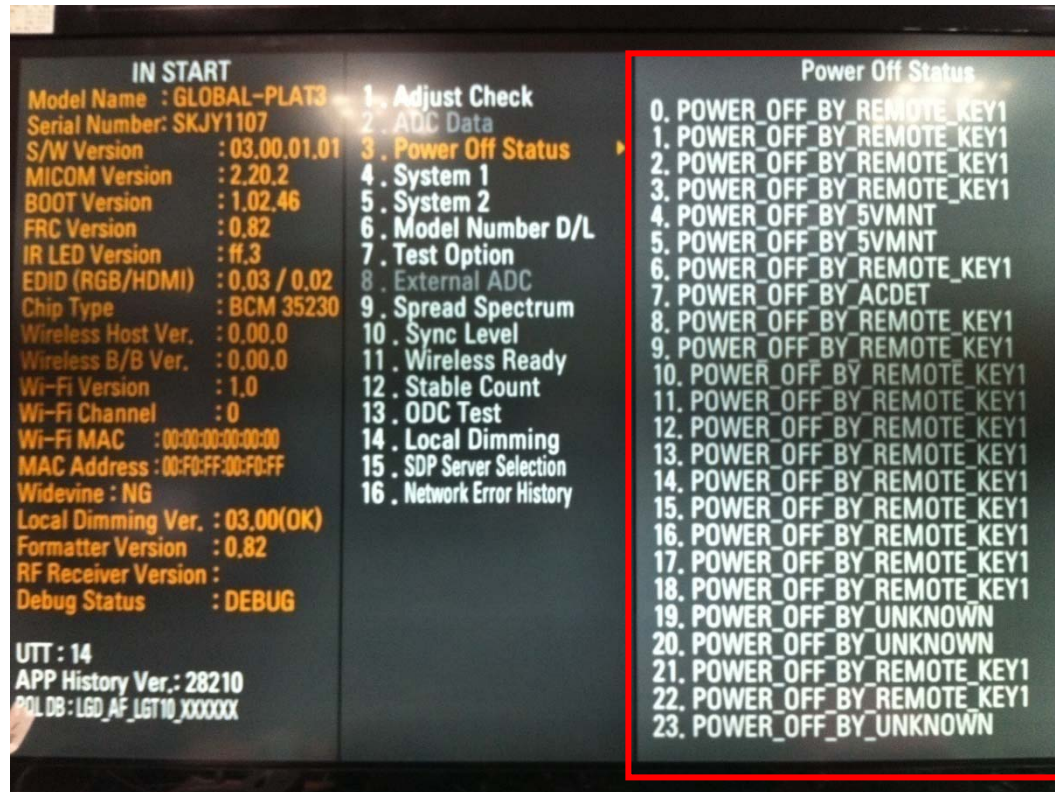
24 Pin (Power Board ↔ Main Board) – 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C (Only LPB : V-sync)
17	12V	18	Inverter On/off
19	12V	20	N.C (LPB, Lamp : A-dim)
21	12V	22	PWM Dim #1
23	N.C (only Lamp SCANNING Model : PWM Dim #2)	24	Error-out



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _Off when on, off whiling viewing	Established date	2011. 12 .14	
	Content	POWER OFF MODE checking method	Revised date		A22

<ALL MODELS>



## Entry method

1. Press the IN-START button of the remote controller for adjustment
2. Check the entry into adjustment item 3

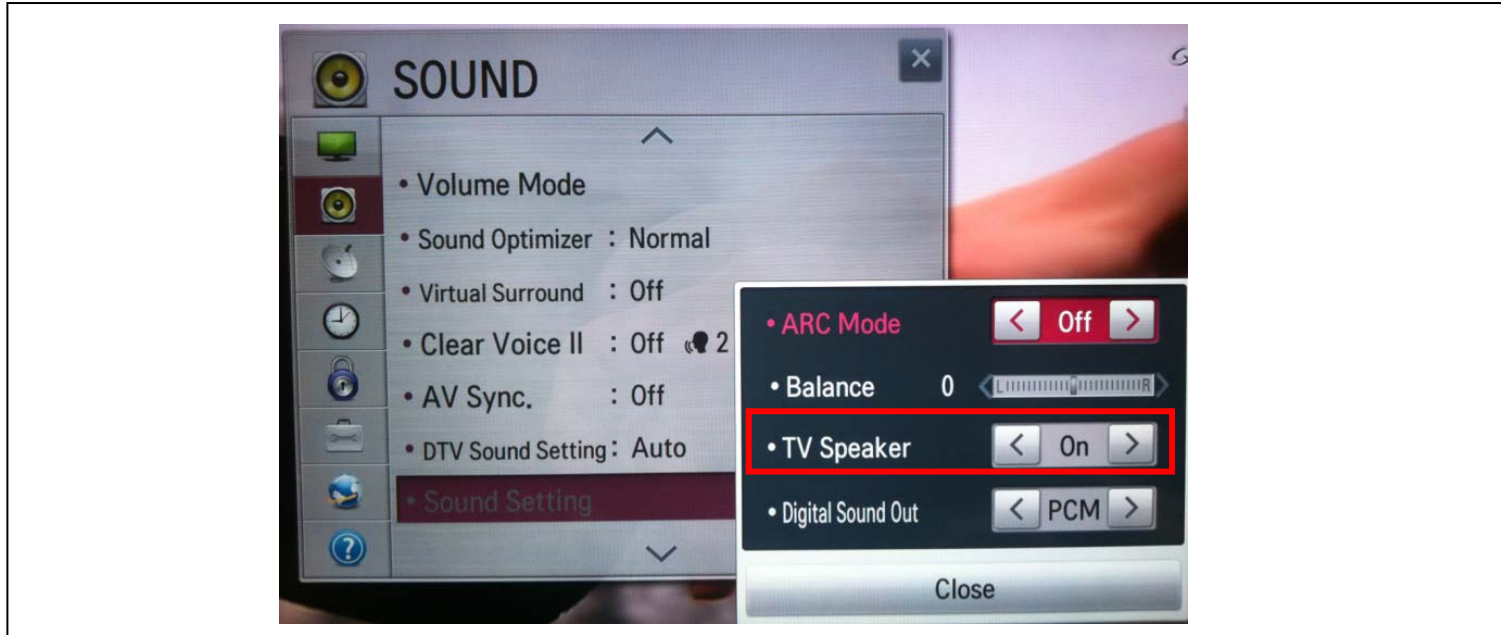
A22



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2011. 12 .14	
	Content	Checking method in menu when there is no audio	Revised date		A24

<ALL MODELS>



## Checking method

1. Press the Setting button on the remote controller
2. Select the Sound function of the Menu
3. Select the Sound Setting
4. Select TV Speaker from Off to On

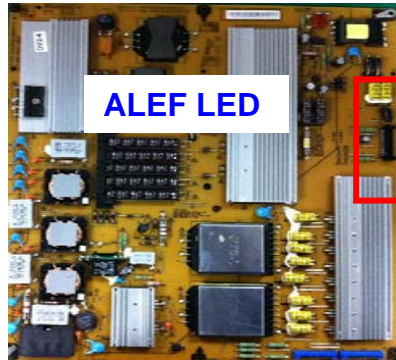


A24

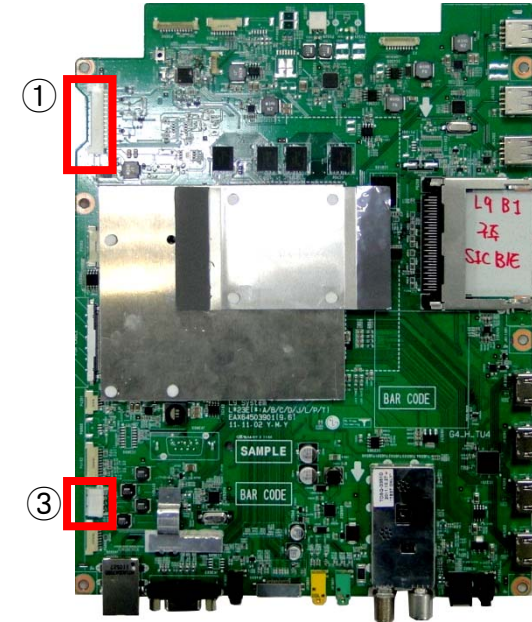
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2011. 12 .14	
	Content	Voltage and speaker checking method when there is no audio	Revised date		A25

<XXLM9600>



24 Pin (Power Board ↔ Main Board)			
1	Power on	2	24V
3	24V	4	24V
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	V-sync
17	12V	18	Inverter On/off
19	12V	20	N.C
21	12V	22	PWM Dim #1
23	PWM Dim #2	24	Error-out



## Checking order when there is no audio

① Check the contact condition of or 24V connector of Main Board

② Measure the 24V input voltage supplied from Power Board  
(If there is no input voltage, remove and check the connector)

③ Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

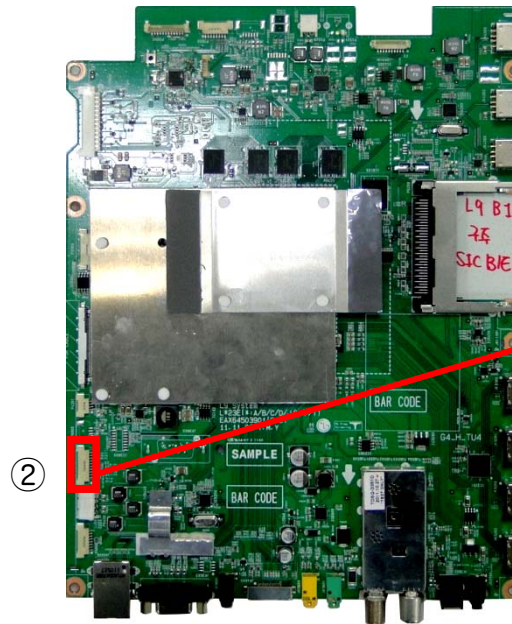
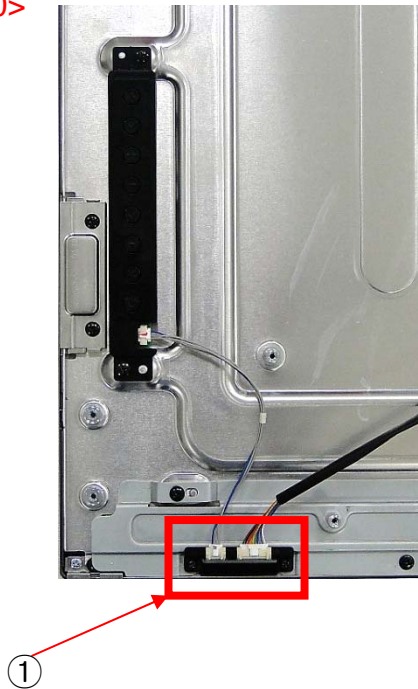
A25



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. Function error	Established date	2011. 12 .14	
	Content	Remote controller operation checking method	Revised date		A27

<XXLM9600>



P4102	
1	SCL
2	SDA
3	GND
4	KEY1
5	KEY2
6	St 3.5V
7	GND
8	GP4 LED R
9	IR
10	GND

## Checking order

- 1, 2. Check IR cable condition between IR & Main board.
3. Check the st-by 3.3V on the terminal 6.
4. When checking the Pre-Amp when the power is in ON condition, it is normal when the Analog Tester needle moves slowly, and defective when it does not move at all.



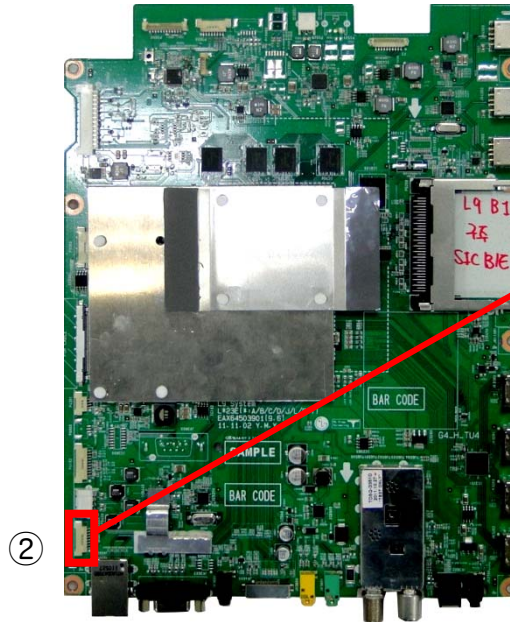
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. Function error	Established date	2011. 12 .14	
	Content	Motion Remote operation checking method	Revised date		A28

<XXLM9600>



①



②

③

P4800	
1	3.3V
2	GND
3	RX
4	TX
5	RESET
6	DC
7	DD
8	GND

## Checking order

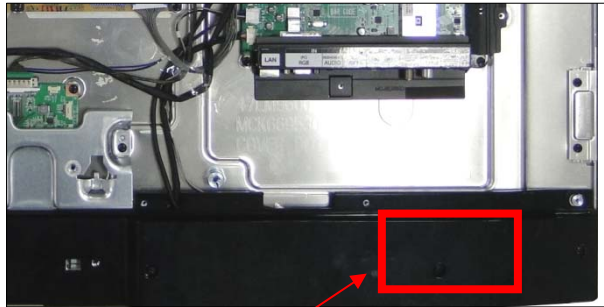
- 1, 2. Check Motion cable condition between Motion assy & Main board.
3. Check the 3.3V on the terminal 1.



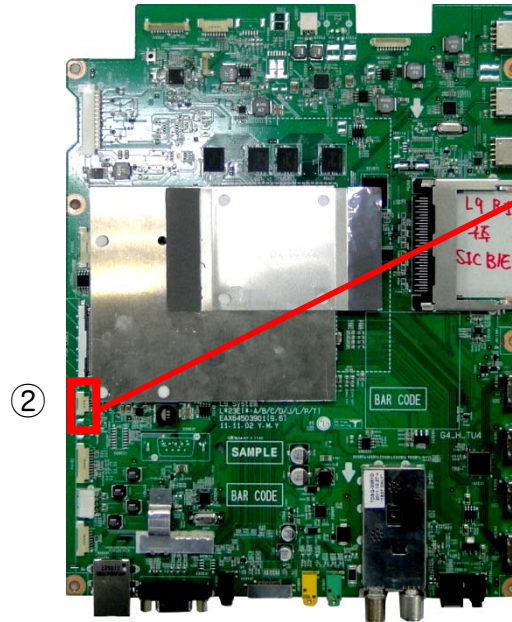
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. Function error	Established date	2011. 12 .14	
	Content	Wifi operation checking method	Revised date		A29

<XXLM9600>



①



②

③

P4301	
1	VDD
2	DM
3	DP
4	GND

## Checking order

- 1, 2. Check Wifi cable condition between Wifi assy & Main board.
3. Check the 5V on the terminal 1.

